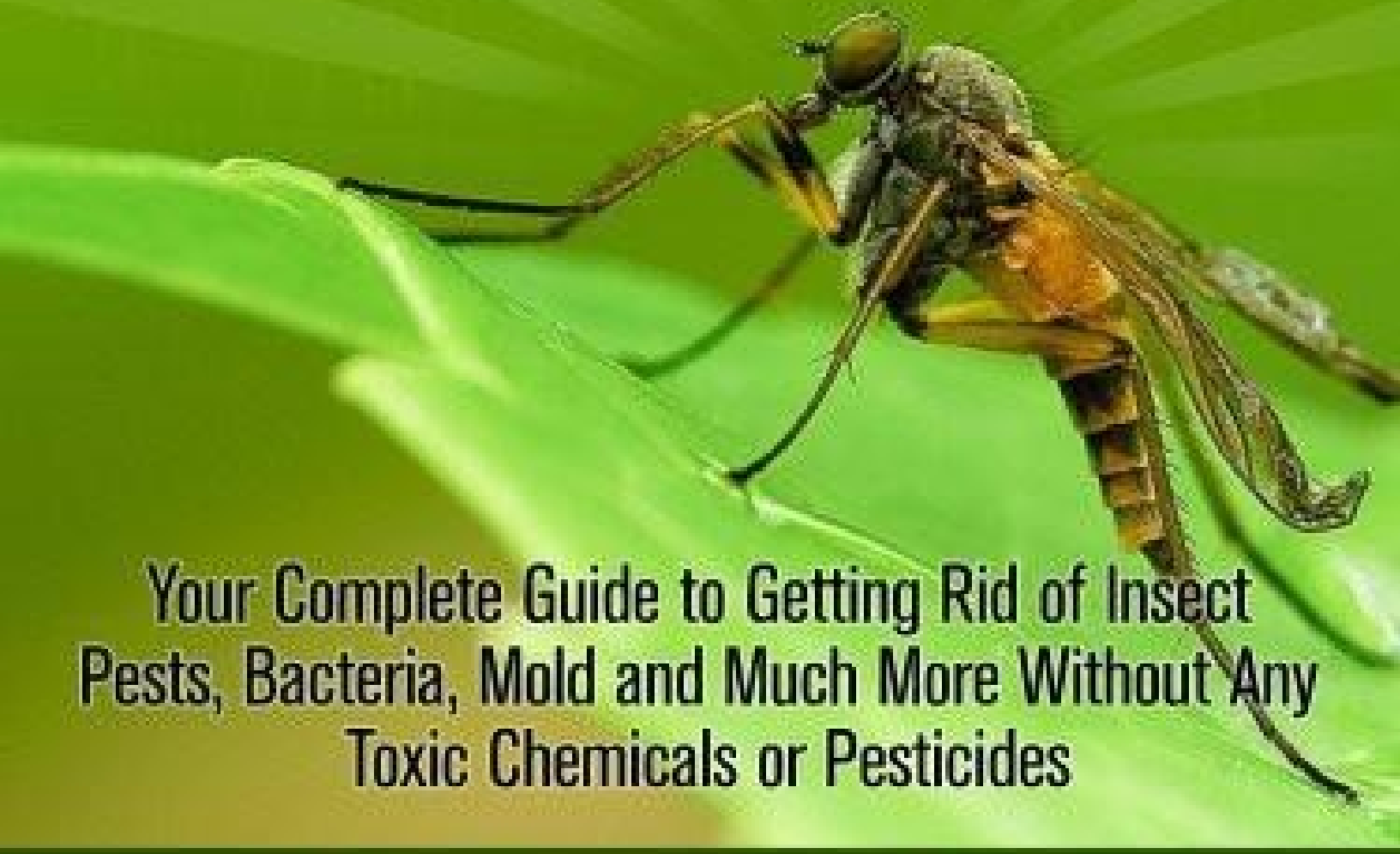
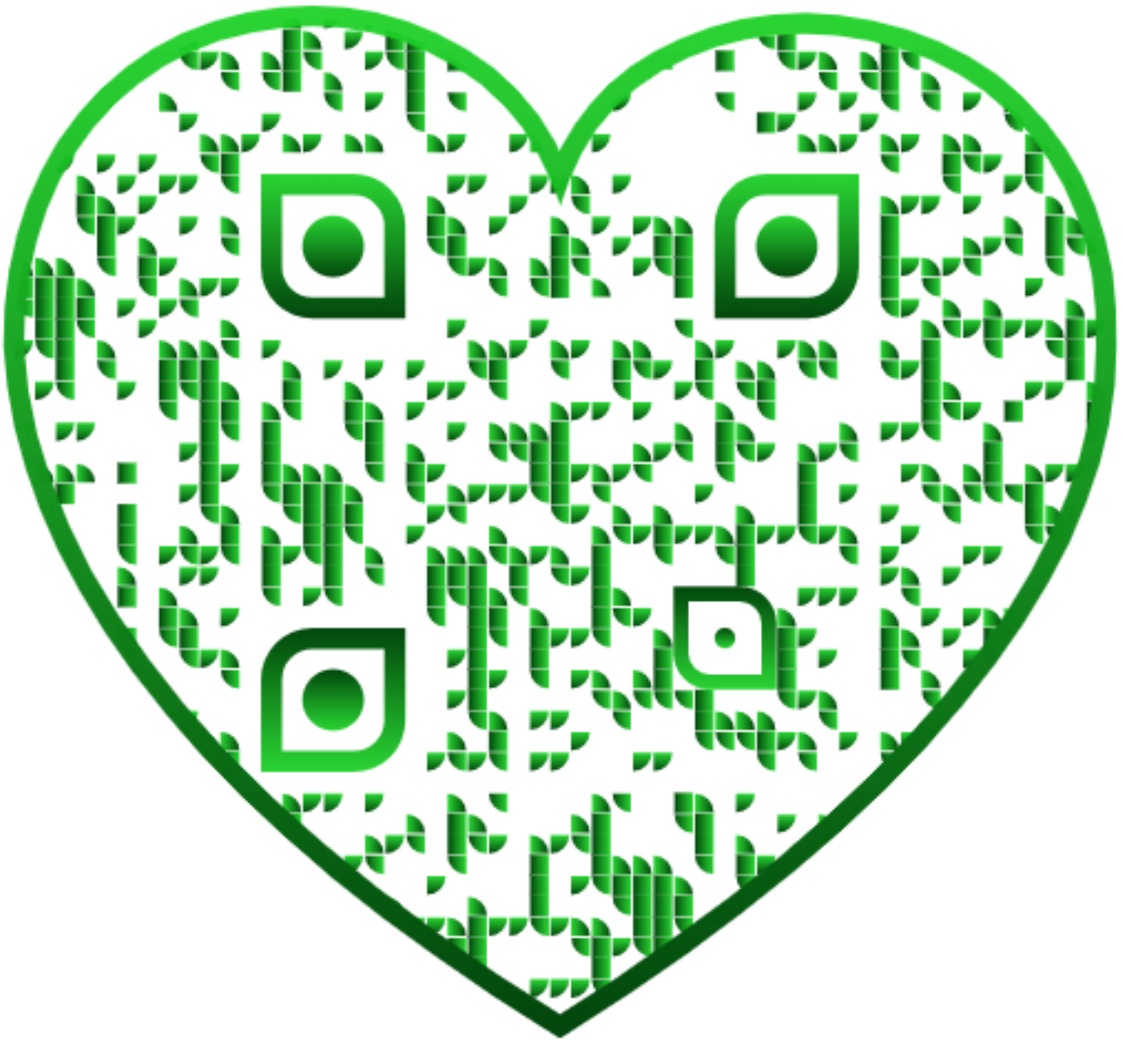
THE NATURAL PEST CONTROL MANUAL



Your Complete Guide to Getting Rid of Insect Pests, Bacteria, Mold and Much More Without Any Toxic Chemicals or Pesticides

Stephen Tvedten



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Your Complete Guide to Getting Rid of Insect Pests, Bacteria, Mold and Much More Without Any Toxic Chemicals or Pesticides

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INTRODUCTION

OMG! You have just found a "terrible bug" problem - now what do you do? Most people simply run out and buy some pesticide POISONS to try to "solve/control" all of their pest problem(s) in fact, approximately 59% of American homes continue to use/misuse pesticide POISONS on a regular basis to try to "control" their pest problem(s). What "they" do not realize is, even a slight exposure to pesticide POISONS can have deadly effects on their health and most especially the health of their children, whose nervous systems are still developing.

Why do "they" still use POISONS? Because people have been *CON*vinced of the "safety" of POISONS and of the "terrible" dangers of insect pests by the very bu**SIN**ess people who profit from these lies! (**It is actually illegal to advertise the use of any pesticide POISON as safe – even when it is used exactly as directed**.)

Pesticide POISONS are specifically designed to poison living creatures, ones whose basic biology is often strikingly similar to our own. Our culture has now CONvinced most people that "bugs are dangerous and/or that they harbor disease". But in most cases, the known dangers of pesticide POISONS far outweigh the potential dangers of all of the pest insects. You need to realize that of all the possible common household insect pests - only a very few actually pose any potential threat to you and yours e.g., the black widow spider and brown recluse spider. Because poisonous spiders do not clean themselves to digest any pesticide POISON they contact, they rarely are controlled with any of the pesticide POISONS. Therefore vacuums, gorilla duct tape and simple preventative measures and common sanitation practices are far more effective against poisonous spiders than any/all pesticide POISONS. As for disease-carrying insect pests in the USA, the instances of any known diseases caused by insects in the world is very low, **only seven insects out of a total of the approximately 1,000,000 named insects on Earth can cause disease.**

Compare this potential danger with all of the very considerable research that indicates even low concentrations of many pesticide POISONS can and do seriously endanger your health and even cause your death. Each year another commonly used pesticide POISON is banned for indoor use, yet, these POISONS can continue to contaminate your home and workplace for decades afterwards. **The inherent danger of pesticide POISONS is a very real and very scary thing - so why trade your health for a false sense of security?**

In May 1998, two groups of Yaqui Indian preschoolers were compared - both groups lived in Sonora, Mexico and had similar genetic backgrounds, diets, cultural beliefs, and social behaviors. Half of the children grew up in farming communities where pesticide POISONS were used often and the other half grew up in a non-farming region where pesticide use was rare. All of the children were asked a simple task: to draw a person. The low-pesticide exposed children's drawing was recognizable, while the high pesticide exposed children drew random circles and lines. **Unprovoked violence was seen among the exposed children and not_among the unexposed**. Some children were observed hitting their siblings when they passed by, and they became easily upset or angry with a comment made by a parent.

hese aggressive behaviors were not observed in the unexposed children. In 2005, Yaqui Indians enacted a declaration to stop the use of banned pesticides in agricultural fields, which were resulting in cancer and death. Aerial spraying of crops and the unmonitored, unregulated storage of dangerous pesticide POISONS are damaging Yaqui communities**. Poisoning from exposure to toxic contamination is resulting in the deaths of young children and adults. This study has brought attention to the health effects of household pesticide POISONS on children.** Household pesticide POISONS are a greater threat to children than to adults because children crawl and play on the floor and lawn where they are directly exposed to the pesticide POISONS. Pesticide POISONS are also a greater threat to children than to adults because the children's bodies are still maturing and developing. Please see: www.chemicalbodyburden.org/hb_cs_mexico.htm and www.environmentalhealthnews.org/ehs/blog/headline-overstates-pesticides-impair-lactation**.**

In a pest control career that covers about fifty years, the Author has continually found that pesticide POISONS are not only dangerous but they do not really control or solve your pest problems! Pesticide POISONS can cause adverse health effects on your nervous and immune systems and can cause these harmful effects to both adults and children. Conventionally grown tomatoes can carry at least 35 different pesticide POISON residues, according to the 2008 US Department of Agriculture Pesticide Data Program.. Exposure to chemical pesticide POISONS can harm and even kill you and yours! US Environmental Protection Agency made a study to analyze the dangers of just ingested pesticide POISONS. Children aged between 3 and 11 were given conventional foods for the first three days and organic foods for the next five days. When the children ate conventional foods, their urine samples contained 5

to 263 parts per billion concentration of malathion metabolite. As they shifted to organic foods, it was found that their urine samples contained zero concentration of malathion. This study also showed that the children were ingesting the organophosphorus pesticide POISONS, which can damage both their nervous systems and reproductive systems and can cause developmental and behavioral abnormalities.

More than 16 million Americans are already known to be sensitive to pesticide POISONS. Pesticide POISONS also contribute towards many health risks such as leukemia, lung, brain and testicular cancer, liver and pancreatic damage, decreased sperm counts and spontaneous abortions and birth defects. Pesticide POISONS pose dangers to the environment too. They not only kill some of the target pests, but they also kill other beneficial organisms like dragonflies, earthworms, birds, insects and fish. This in turn can cause loss of biodiversity and death of wild life.

Common pesticides and fertilizers can damage both the development and survival of amphibians to varying degrees, according to a new analysis by Oregon State University. The new meta-analysis marks the first attempt at a large-scale summary on the negative effects of specific chemical classes on amphibians, said Tiffany Garcia, a co-author of the study and an associate professor of wildlife science within OSU's College of Agricultural Sciences. Researchers reviewed more than 150 scientific studies detailing the impacts of pesticides and fertilizers on amphibians. **Around 30 percent of amphibian species are now extinct or endangered due to a range of factors, including habitat loss, disease, and exposure to contaminants, including pesticides and fertilizers, according to Garcia. "Billions of tons of agrochemicals are used in farming every year,"** said Garcia, an expert in aquatic ecology. "Any disruption to frog, toad and salamander communities has clear negative impacts on biodiversity and can also set off a domino effect throughout the ecosystem by damaging the food base for amphibian predators, including birds, snakes and fish."

It is a fact that: 1.1 billion pounds of pesticide POISONS are being yearly used in the US alone and children living in homes treated with pesticide POISONS have a 600 percent higher risk of developing leukemia. Even pets in "treated" homes have a higher risk of cancer. These POISONS now contaminate all of our air, soil and water. So, what do you do? Do you keep the pests you just found as "pets" and give them names or find a safe, far more effective way to actually control them?. If you really want to learn how to safely and far more effectively control your pest problems - read on!

Most insect and rodent pests are attracted to your food and water, so start off your pest control efforts by making your home less enticing to these free-loading pests. Turn on your fans, air conditioners and/or dehumidifiers. Install better lighting that will not attract insects. Wipe up spills immediately with soap and water. Take out garbage daily and keep your garbage cans clean. Keep ripe fruit in the fridge. Wash dishes daily, or at least submerge them in soapy water until you can get to them. Make sure all food and beverage containers outside the fridge or freezer are tightly sealed. Glass jars with rubber seals or plastic containers with tight snap-on lids are actually better than screw-top jars for storing food. Mop, sweep and vacuum your floors regularly. Keep bathroom and kitchen areas as dry as possible. Fix leaky faucets and never let standing water accumulate. If you have a pet, comb it regularly with a flea comb and wash its bedding frequently. Be sure to vacuum floors, rugs and upholstery your pet comes in contact with regularly.

Deny access to invaders by making sure all potential entry points are sealed off. Use silicone caulk to seal any cracks and crevices in the foundation, baseboards, moldings, cupboards, pipes, ducts, sinks, toilets and electrical outlets. Place screens in front of heating and cooling vents, and repair holes in any existing screens. Keep vegetation, stacked firewood and other debris away from the exterior of your home so pests can't climb up and into your home. Routinely clean with Safe Solutions Tweetmint Enzyme Cleaners with Peppermint. **The Author basically removed all the pest problems inside and outside in over 380 schools using only Safe Solutions Tweetmint Enzyme Cleaner with Peppermint and their food-grade diatomaceous earth (DE). Always choose to use a safe alternative control rather than using and/or misusing dangerous pesticide POISONS!**

There are many other toxins inside your home, causing issues like breathing difficulties and infertility that you will need to remove. Mold is a common cause of household illnesses and it’s often hiding in all kinds of surprising places e.g., embedded between walls, inside the insulation of a roof, or under carpeting. If you’ve noticed respiratory problems or skin outbreaks along with a musty or dank odor around your home, you might have a mold problem.

Your home needs to be warm and dry to prevent mold…and you might need to tear up old carpeting, remove damaged insulation, and take other steps to get rid of any mold problem. Some bathroom and kitchen cleaners are very harsh. They can contain a variety of synthetic chemicals that are not good to inhale and have been linked with issues like lowered sperm count and cancers. Consider some all-natural cleaning alternatives and break away from the harsh chemical

solution to household messes. Flame retardants are chemicals are added to textiles and upholstery to make them fire-resistant, but they're also highly toxic. In many states, they're no longer required, or companies are using alternatives to traditional products because of the known toxicity of commercial options. When you buy new furnishings, rugs, draperies, and other home textiles, ask about what kinds of chemicals may have been applied or used in their production. If you are going to repaint, use low VOC paints, which are designed to off-gas less, for a more comfortable repainting job, and one that won't make people sick. Formaldehyde is sometimes used in sheetrock, engineered woods, paneling, and other construction materials. You definitely do not want it in your house, as it's linked with a host of health problems, and it doesn't smell too hot, either. Buy formaldehyde-free for greater health in your home. Many manufacturers who produce without this chemical also take care to avoid other potentially hazardous compounds.

Two vaccine scientists have blown the whistle, revealing that vaccines are designed to fail, causing the spreading of disease rather than its prevention. This is why measles and mumps are on the rise: the vaccines don't work! Drug companies actually spike them with animal antibodies to fraudulently make them appear to produce an immune response: www.naturalnews.com/042864_measles_outbreak_mumps_vaccines_scientific_fraud.html. **Artificial Sweeteners -Some experts say aspartame receives 75% of the complaints to the FDA about food additives. Watch the 3-minute trailer** - www.therealfoodchannel.com/page/10963.html. **The full documentary** - www.therealfoodchannel.com/page/10964.html**.**

Asbestos is no longer used in home construction. Asbestos was once extremely common on furnace ducts and in shingles and tile. It was durable, fire-resistant and affordable. Unfortunately, it was also cancerous. If you're renovating or considering the purchase of an older home, you need to have it evaluated for asbestos first, and if it is present, you should discuss mitigation options with an expert. It may make sense to have it removed by a trained team. **If you have an older home, you probably already know about the lead problem: this toxic metal was once widely used in pluming and in paints**. Take care when stripping layers of old paint, as you may need to bring in specialists to handle it. Those considering a repainting job to cover lead paint are strongly encouraged to get this toxin out of their homes. Treated lumber used to contain arsenic and should be avoided at all costs. We don't know about all of the dangers of "modern living" e.g., people were told for years that soft, flexible plastics weren't harmful. Today, we know that the plasticizers used to make

them so flexible and durable are actually cancerous, especially when exposed to heat and repeated uses. **The Author believes if G-d made it - you can use it - if man made it – RUN AWAY!**

"More than 80,000 chemicals are in commercial use in the United States today, and most were released to the market without any real research regarding their long-term, low-dose effects on human health. The Center for Disease Control (CDC) has documented that we Americans are now all carrying more than 200 toxic chemicals in their bodies." Why?

Because the average American home today contains at least 62 toxic chemicals which are more toxins than even a chemistry lab had at the turn of the Twentieth century! Of the 80,000 synthetic chemicals that have been produced since WW II; less than 2% of them have been tested for toxicity, mutagenic, carcinogenic, or birth defects. The majority of chemicals have never been tested for any long-term health effects. An EPA survey concluded that our indoor air was 3 to 70 times more polluted than outdoor air.

Another EPA study stated that the toxic chemicals in household cleaners are 3 times more likely to cause cancer than outdoor air. CMHC reports that our homes today are so energy efficient that the volatilization (out gassing) of chemicals have nowhere to go, so contamination builds up inside the home. We spend 90% of our time indoors, and 65% of our time at home. Moms, infants and the elderly spend 90% of their time in the home. The National Cancer Association released results of a 15 year study concluding that women who work in the home are at a 54% higher risk of developing cancer than women who work outside the home. Cancer rates have almost doubled since 1960 and Cancer is the Number ONE cause of death for children. There has been a 26% increase in breast cancer since 1982. Breast cancer is the Number ONE killer of women between the ages of 35 and 54. **Primary suspects are laundry detergents, household cleaners and pesticide POISONS. These poisons compound the damage caused by excess estrogen, low progesterone, antiperspirants, x-rays and trauma to the breast.**

The Center for Environmental Health (CEH) recently published the findings of an independent study it conducted which found that 98 tested

shampoos, soaps and other personal care products contained high levels of cocamide diethanolamine (cocamide DEA), a hidden foaming and thickening agent that is a known carcinogen.

There has been a call from the U.S./Canadian Commission to ban chlorine bleach in North America. Bleach is being linked to the rising rates of breast cancer in women, reproductive problems in men and learning and behavioral problems in children. Chlorine is added to sugar to make an artificial sweetener called sucralose (Splenda). www.truthaboutsplenda.com. **Chlorine bleach is what we add to "purify" our drinking water!** Chemicals get into our body through inhalation, ingestion and absorption.

We breathe 10 to 20 thousand liters of air per day. **There are more than 3 million poisonings every year. Household cleaners are the Number ONE cause of poisoning of children. Since 1980, asthma has increased by 600%. The Canadian Lung Association and Asthma Society of Canada identify common household cleaners and cosmetics as triggers**. ADD/ADHD are epidemic in schools today. **Behavioral problems have long been linked to exposure to toxic chemicals and molds.** Use of Ritalin and similar drugs has skyrocketed since 1990. Chemical and environmental sensitivities are known to cause all types of headaches and health problems. Labeling laws do not protect the consumers; they protect big business**. The New York Poison Control Center reports that 85% of product warning labels were either inadequate or incorrect for identifying a poison and/or for first aid instructions.**

Steam cleans better than bleach - According to Chuanwu Xi, Assistant Professor in the Department of Environmental Health at the University of Michigan, "Scientific studies have found that biofilms can be up to 1000 times more resistant to biocide inactivation than are suspended microbes. It is extremely difficult to get rid of biofilms and kill them. The efficacy of the steam vapor system is important because even strong chemical disinfectants such as bleach when allowed 20 minutes of dwell time did not achieve the same degree of kill that a steam unit accomplished in three seconds." **With no harmful residues!**

Formaldehyde, phenol, benzene, toluene, xylene and thimerosal (mercury) are found in common household cleaners, cosmetics, beverages, fabrics and cigarette smoke. The FDA does not mandate that ingredients comprising less than 1% of a cosmetic product be listed in labeling. **These chemicals are cancer causing and toxic to your immune system. Toxic chemicals are attracted to, and stored in your fatty tissue**. The brain is a prime target for these destructive

toxins because of its high fat content and very rich blood supply.

The National Institute of Occupational Safety and Health has found more than 2500 chemicals in cosmetics that are toxic, cause tumors, reproductive complications, biological mutations and skin and eye irritations. Fibromyalgia, chronic fatigue syndrome, arthritis, lupus, multiple sclerosis, circulatory disorders, Alzheimer's, Parkinson's disease, irritable bowel syndrome, depression, and hormonal problems are diseases commonly related to chemical exposure. Pesticide POISONS only have to include their active ingredients on their POISON labels, even though the inert (inactive) ingredients may account for 99% of the ingredients, many of which are extremely toxic and are also dangerous poisons. "Inert" is an oxymoron in this case.

Pest control firms - also called pest control operators (PCOs) - are in the buSINess of identifying pests and applying poisonous chemicals to try to kill the pests. The PCOs buy their pesticide POISONS and other control systems from distributors or directly from the large number of chemical manufacturers. Chemicals are identified as general or restricted use, the latter are far more deadly and dangerous. Major pest control companies include Terminix (owned by ServiceMaster) and Orkin (owned by Rollins) as well as the pest control operations of Swisher International, Rentokil Initial, and Eco Lab. The US pest control services industry includes about 12,000 establishments (single-location companies and branches of multi-location companies) with combined annual revenue of about $8 billion.

In 1942, when the Author was born, a now banned pesticide POISON was also born - Paul Hermann Muller of Switzerland discovered the insecticidal properties of a synthetic organic chemical, dichlorodiphenyltrichloroethane (DDT) which had first been synthesized in 1874. In 1948 Muller received the Nobel Prize for Physiology or Medicine for his discovery. The commercial product is 65% to 80% active compound. An amorphous powder, it has a lower melting point than the pure compound. DDT is applied as a dust or by spraying its aqueous suspension. A persistent pesticide POISON, DDT has many properties that were desirable in an insecticidal point of view. **It is so stable that it remains as virtually as a permanent contaminant** in soil and aquatic environments, and in animal and plant tissues. Microorganisms, enzymes, heat, or ultraviolet light do not readily break it down. **Today virtually every living organism/person has DDT and/or its metabolites stored inside its blood and tissue!** DDT is an organochlorine, one of four types of synthetic organic insecticide POISONS. Usually containing carbon, chlorine, and hydrogen, organochlorines are also known as "chlorinated organics," "chlorinated insecticides," or "chlorinated synthetics." Included are methoxychlor, lindane, toxaphane, and the closely related group of aldrin, dieldrin, chlordane, heptachlor, and endrin.

DDT adversely affects the central nervous system. Both in insects, in mammals and in people, DDT adversely affects the normal transmission of nerve impulses. The neurons eventually send spontaneous impulses that cause the muscles to twitch; this may lead to death. Large amounts of insecticide POISON repeatedly sprayed on plants will eventually enter the soil, killing living organisms there. These organisms include invisible bacteria, fungi, and algae which break down plant residues to release minerals, carbon, and

nitrogen, insects which break down plant matter into new soil, and earthworms which dig tunnels that aerate the soil.

Pesticide POISONS can cause the soil to become totally contaminated and useless for cultivation. Chemicals sprayed on land can seep into rivers and streams. Some pesticide POISONS come in contact with groundwater, a major source of our drinking water. The major effect of environmental pollution is a process known as bioconcentration. Widely used insecticide POISONS affect the food chain because they degrade very slowly and are highly soluble in fat. After these chemicals are applied on land, they are washed by rains into streams, rivers, and lakes. There they are ingested by microscopic life forms, which are food for fish. The fish are then eaten by larger fish and aquatic birds. After animals ingest the pesticide POISON through their prey, the compound is stored and concentrated in their body fat. Repeated feeding causes high concentrations of the pesticide POISON(s) to build up. **Thus, the higher up on the food chain an organism is, the more concentrated the intake of pesticide POISON(S).**

The accumulation of DDT or its relatives in birds affects their ability to reproduce. DDT disrupts the formation of eggshells in the body of the female. Consequently, some species lay soft-shelled or shell-less eggs. Ospreys and bald eagles have been especially threatened as a result. The effects of pesticide POISONS on mammals are not as obvious and are still being investigated. Some studies suggest that DDT can inhibit the productivity of plant plankton, upon which all other marine life depends. How harmful a pesticide POISON is to humans depends on the amount and susceptibility of that person. People with heavy exposure to chemicals during manufacture or use are most seriously affected. In the short term, there are severe **acute** reactions to touching or inhaling large quantities of pesticide POISONS. In the long term, the **chronic** exposure to pesticide POISONS can cause adverse health effects such as cancers, birth defects, genetic damage, respiratory ailments, liver and kidney damage, neurological disorders, and reproductive problems.

Some insects are naturally more resistant to certain chemicals. As their susceptible members die, these survivors multiply, passing their resistance to the next generation. The pesticide POISONS no longer “control” at normally recommended rates. Some insects might develop cross-resistance, where resistance to one insecticide POISON means resistance to a second with a similar mode of action as the first, or multiple resistance, where there is resistance to several classes. Depending on the type of resistance and the species of pest, resistance tends to last in the absence of the pesticide POISON. Pest resurgence occurs when pests killed by insecticide POISONS return in larger numbers than before. This happens because the pesticide POISONS remove target insects and their natural enemies. Either the natural enemies are killed or they leave the area since their food is no longer available. There is an opportunity for the temporarily removed pests to reproduce before their natural enemies can return. A new species may become serious pests when their natural predators are killed. Spider mites, for example, caused havoc when DDT and other insecticide POISONS killed their predators. Because of the discovery of insect resistance, persistent residues (POISON CONTAMINATION) in soil and in living tissue, accumulation in food chains, and harmful effects to wildlife, there has been a decline in the usage of organochlorines. They have been replaced by the other three synthetic organic insecticide POISONS--organophosphates, carbamates, and synthetic pyrethroids.

This little book will use a safer and far more effective approach called Intelligent Pest Management ® (IPM). This controls your pests by combining methods such as safer chemicals, natural enemies, resistant plants, and cultural and mechanical controls. Biological controls include releasing predators, parasites, or pathogens of the pest species, simulating the scent of female insects to lure males into traps, and releasing sterilized pests to disrupt the reproductive cycle. Farming techniques incorporate the planting of pest-resistant crops and frequent rotation of crops. The goal of IPM is to reduce the number of pests to a level not damaging to you or the economy. It also is used to maximize the good from actually controlling pest insects and to minimize the harm to the environment.

ARE THERE ANY SAFE PESTICIDE POISONS?

Pesticide POISONS Are ALL Too Harmful For You To Use In Any Form - The link between common household pesticides and fetal defects, neurological damage and the most deadly cancers is strong enough that **family doctors in Ontario are urging their citizens to totally avoid these any of these POISONS in any form**. This frightening message came from the **Ontario College of Family Physicians** who recently released the most comprehensive study ever done in Canada on the chronic effects of pesticide POISON exposure at home, in the garden and at work.

Their review found consistent evidence of the health risks to patients with exposure to pesticide POISONS. The study said, naming brain cancer, prostate cancer, kidney cancer, pancreatic cancer and leukemia among many other acute illnesses. **As well, the college found consistent links between parents' exposure to certain agricultural pesticide POISONS at their jobs and effects on a growing fetus ranging from damage to death.** The risks, they concluded, can come even from pesticide POISON residues on food, ant spray and the tick collar on the family cat. The researchers also found that children are far more vulnerable to the effects of pesticide POISONS than the adults because their bodies are growing, they have a greater skin surface in proportion to their size than adults, they ingest more food for their size than adults and they often have less-developed systems to excrete toxic chemicals.

Not only that, but after examining 12,000 studies conducted from 1990 to 2003 around the world, and winnowing that down to the most sound 250, the researchers said there is no evidence that some pesticide POISONS are less dangerous than others, just that they have different adverse effects on health that take different periods to show up.

Physicians For Social Responsibility also warn that pesticide POISONS come in many forms but all are, by their specific design, toxic to living organisms. In our efforts to rid our crops, homes, and gardens of weeds and pests, we have totally covered ourselves and the earth with mixtures of volatile synthetic POISONS with only a minimal understanding of how they affect our health. Annually, Americans use more than 4.5 billion pounds of pesticide POISONS, including about 1 billion pounds of "conventional" pesticide POISONS that are used in agriculture, industry, home and garden. Every day, we are unknowingly exposed to a variety of pesticide POISONS in our air, food, drinking water, breast milk, homes, hospitals, places of worship, schools, parks

and offices**. Each year, thousands of people in the U.S. become ill or are hospitalized just as a result of acute pesticide poisoning**. Yet we are now only beginning to understand that even the low levels of pesticide POISON exposure we encounter every day can lead to serious **chronic** illness and disease over time**.**

Studies confirm that low levels of pesticide POISON exposure can be linked to such serious conditions as cancer; damage to the nervous system, reproductive system and other organs; developmental and behavioral abnormalities; disruption of normal hormonal function; and immune dysfunction. Ever wonder why people are so worried, depressed, irritable, nasty, rude, unsocial, angry, vulgar and/or violent?

A growing body of research supports the association between pesticide POISON exposure and adverse human health effects including depression, ADHD, anxiety, confusion, memory loss, lethargy, pervasive developmental disorders, unprovoked extreme agitation, anger, rage, and violence. Epidemiological evidence suggests that mood changes after acute pesticide POISON exposures can continue for many years and that repeated high chronic exposures greatly increase the risk of mood disorders**. Given that symptoms may not occur until after a period of repeated exposures, health care providers should consider both acute and chronic exposures when evaluating their patients. The Author believes that this contamination of toxins causes us to be "permanently" intoxicated and puts more and more of our children in Special Education Classes!**

Both chronic and acute exposures to pesticide POISONS are threats to human health, but in different ways. Acute, high level exposures can have immediately recognizable and harmful consequences, while chronic, low level exposure may not show an impact for years or decades. The scientific and medical community also is beginning to investigate the possible harm caused by the accumulation and interaction of multiple pesticide POISONS in the human body. Most households use some form of pesticide POISONS such as an insect repellant, weed killer or a flea collar for the pet. However, there are pesticide POISONS in many other products as well. **Antibacterial liquid hand and body soaps contain the pesticide POISON Triclosan never approved by the FDA for consumer use**. Treated wood for playgrounds and tree houses, soap, pool chemicals, shelving paper, even the waxy coating on fruits and vegetables contain some level of pesticide POISONS. We are exposed to these low levels of pesticide POISONS every day without fully understanding the dangerous health effects they may have. There is mounting evidence for a wide range of health

effects. It is clear that developing fetuses, infants and young children are particularly sensitive to the harmful effects of these synthetic pesticide POISONS**. When exposed to a toxic chemical, children are much more likely to experience an adverse health reaction at lower doses than adults. Developing and growing bodies are much more susceptible to pesticide POISON contamination than grown bodies.**

Pesticide products containing synthetic pyrethroid POISONS are often described by pest control operators and community mosquito management bureaus as "safe as chrysanthemum flowers." While pyrethroids are a synthetic version of an extract from the chrysanthemum plant, they are chemically engineered to be more toxic, take longer to break down, and are often formulated with synergists like Piperonyl Butoxide, increasing potency, and compromising the human body's ability to detoxify the pesticide POISON! Pyrethriod POISONS are known irritants and can have a high acute toxicity depending on the specific formulation. Pyrethriod POISONS have also been connected to multiple symptoms of acute toxicity, asthma, incoordination, tremors, and convulsions. In addition to human health effects, which this cumulative risk assessment addresses, pyrethroid POISONS are also persistent in the environment and adversely impact non-target organisms**. A 2008 Survey found pyrethroid POISON contamination in 100 percent of urban streams sampled in California**.

'The Environmental Working Group's study commissioned five laboratories to examine the umbilical cord blood of 10 babies of African-American, Hispanic and Asian heritage and found far more than 200 chemicals in each newborn!.

* Brain Tumors in Children Are Up 25%

* Leukemia Up 57%

* Brain Cancer Up 25-50%

* Kidney Cancer Up 47%

* 150 Chemicals in Your Home That Can Cause Cancer, Allergies, Birth Defects & Behavior Problems

* EPA - Indoor Air is 2-5 x's More Toxic Than Outdoor Air.

* 10x's More Cancer in Cities With Heavy Pollution.

* Scientists Found Outdoor Air Pollution Increases Risk of Lung Cancer by 9%.

* Toxic Chemicals Found in The Blood, Urine, Fat, Stool, Breast Milk & Semen

* Newborn Babies - Cord Blood Has at least 287 Toxins

* Presently You Are Exposed to 80,000 Known Chemicals - Only 10% or Less Are Checked For Safety

So, Use a proper water purifier and use a proper air purifier. Get a quality vacuum. Eat organic non-GMO food. WATCH your cleaning materials. Avoid: Ammonia, Pine or phenol products such as Lysol. No plywood or synthetic filled furniture. (Use all natural wood, hard plastics, metal, glass, natural stuffing and covers.) No pesticides, urethane, polyester, forms filling synthetic or smelly mattresses/pillows. Avoid linoleum flooring, soft vinyl, synthetic or moth treated carpets. Cookware: NO plastic for storage: mayonnaise, maple syrup etc. ABSOLUTELY NO ALUMINUM or LEAD PANS. Never drink from aluminum cans. (Soda pop/beer). No microwave ovens. (Use electric toaster ovens). Use nothing with aspartame or saccharine! (Alternative: Stevia). Try not to wear polyester. It has formaldehyde which causes cancer. Don't use dry cleaning. Chemicals in dry cleaning fluid cause cancer. (Perchlorethylene). Be cautious with personal body products, lotions, creams, lipstick, etc. (Beware of lauryl sulfate, DEA, cocamide, Quaternium 15, PRG Sastee 40, Polypropylene glycol, glycerin, and Talc. All can cause cancer.) No moth balls. (Use mint, cloves, herbs, in zip locked vacuum plastic garment bags). No fluoride toothpaste. (nor fluoridated water). No regular hair dyes. (They also cause cancer. Use natural dyes – like henna). No regular sanitary products. Avoid disposable diapers. They contain plastic and Bisphenol A. Never live in a moldy home, near an expressway or toxic dump site. Watch out for excess electromagnetic radiation from high power electric wires, TV stations and cell towers. Allow only ceramic fillings for dental care. NEVER get mercury or metal fillings. No root canals, they are always a problem later. **Study to show yourself approved before you do anything new!**

INTELLIGENT PEST MANAGEMENT®

The Art of War - In any war, one must have a sword (an offensive weapon) and a shield (defensive protection) - when we choose to only use volatile, synthetic pesticide poisons to "control" our insect pest problems, we have no shield, no protection and our only "weapon" is attacking <u>us</u> and <u>not</u> our enemy. Early in the 1990s we knew that in our ongoing war against home and garden pests, over 70 million American households made more than 4 billion pesticide POISON applications each and every year without ever eliminating the need to continually “treat’ the insect pests! At least 85% of Americans or 84.5 million households maintain a poison arsenal of at least 3-4 synthetic poisons ranging from no pest strips, pesticidal shampoos, aerosols, granules, liquids and dusts. There are over 21,000 different over-the-counter household synthetic pesticide poison products containing over 300 active ingredients and as many as 1,700 "inert" ingredients per a 1990 EPA study prepared by Research Triangle Institute.

The "National Home & Garden Pesticide Use Survey" found at least 75% of all American households use insecticide poisons, and consider cockroaches and ants as their leading pest enemies. In 1993, there were over 140,000 reported pesticide poison exposures; 93% of these involved home poison use reported nationwide to poison control centers - about 25% had (acute) pesticide poisoning symptoms (over half involved children under 6**). The poison *industry* is very aware that volatile, synthetic pesticide poisons kill beneficial insects and fungus better than they do the pests.** One University that tests pesticide poisons on pest populations for the poison *industry* wrote me how they use synthetic insecticide poisons and fungicide poisons to protect their insect pest populations! An example of predator-prey relationships that are adversely affected by pesticide poisons is a black fly predator, the caddisfly, which is susceptible to permethrin at rates lower than those necessary to control blackfly. The phytoseiid mites have an LD_{50} 15 times lower to permethrin than the spider mites on which they prey. Obviously, many beneficial insects, e.g., bees, are also killed when one "treats" the insect pests with volatile, synthetic pesticide poisons!

The Chinese Sage, Sun Tzu's "The Art of War" written in China 500 B.C.E. clearly warned: "There has never been a protracted war from which a country has benefited." Dr. Leaky has estimated that we are losing approximately 50,000 to 100,000 species of plants, animals and insects every year just because of man's "footprint". According to ESA member and Pulitzer

Prize winner Dr. E.O. Wilson of Harvard University, there are nearly 10,000,000,000,000,000,000 (10 quintillion) insects in the world. More than one million different species of insects have been identified, but some experts believe that there may be as many as 30 million insect species in the world that have yet to be discovered and identified**. Only about a thousand of the insects are considered to be pests; all of the rest are considered to be beneficial**. **Yet after waging an ever increasing war on just the thousand insect pests, using enough "registered" poisons to literally contaminate the entire world and every living organism, we have not even controlled, much less eliminated, even one insect pest species!**

Since the 1940's advent of volatile, synthetic pesticide poisons we have waged an ever increasing protracted war against insect pest populations and now our air, water, food, mother's milk, blood, and adipose tissue all "normally" contain significant residues of these poisons, their metabolites, their "inerts" and contaminates! We have suffered an ever-increasing array of health effects, damages, and deaths - yet our pest "enemy" continues not only to survive, but to actually increase and flourish. We have continually killed our own allies (the beneficials), poisoned our own water, air, and food and, thereby, sickened, wounded or killed ourselves and our own forces and continually ignored our enemy's natural weaknesses and engaged in warfare using only one (useless) weapon! **We have totally forgotten how to protect ourselves and how to successfully wage war on our insect pest enemies.**

Although pesticide POISONS are supposedly designed to kill pest populations, they are never 100% effective -- a few individuals will always manage to survive and reproduce. These survivors may have either a behavioral trait that helped them avoid the pesticide POISON, or a biochemical trait that allows them to detoxify the pesticide POISON, or some other genetic characteristic that reduces their susceptibility to the pesticide POISON. When these survivors mate, they pass on this "resistance" to their offspring, then subsequent generations will contain fewer and fewer susceptible individuals. Eventually, the entire population will become "pesticide resistant." **In 1950 fewer than 20 species of insects showed signs of synthetic pesticide resistance**. In 1960 Rachel Carson had documented 137 species were resistant to at least one pesticide poison and noted it was the early rumblings of an avalanche of synthetic pesticide resistance. By 1990 the number of documented pesticide-resistant insect and mite species was 504 and, obviously, is still increasing. In addition to over one-half of the resistant pest insects and mites, we have many other pesticide resistances developing, e.g., lice, rodents, bacteria,

fungus, weeds, etc. Volatile pesticide poisons do not effectively control, much less even diminish the pests against which they are continually used/misused! **And the pest problems are getting worse!**

Farmers in the U.S. lost about seven percent of their crops to pests in the 1940s. Since the 1980s, some 13 percent or more of our crops are being lost -- and more and more pesticide POISONS are being used/misused. It's a huge problem, but the pests are only following the rules of evolution: the best-adapted (strongest) survive. Every time chemicals are sprayed on a lawn to kill weeds or ants for example, a few naturally resistant members of the targeted population survive and create a new generation of pests that are even more poison-resistant. That generation breeds another even more-resistant generation; eventually, the pesticide POISON will be rendered ineffective and/or will even kill other wildlife or the very grass/plant it was supposedly designed to protect. Millions of rats aren't even getting sick from pesticide POISON doses that once killed them. In one county in England, these "super rats" have built up such resistance to certain toxins that they can consume five times as much poison as rats in other counties before dying. From insect larvae that keep munching on pesticide-laden cotton in the U.S. to head lice that won't wash out of children's hair, pests are slowly developing genetic shields that enable them to survive whatever synthetic pesticide POISONS humans use/misuse to try to "control" them**! It's been estimated that genetic resistance to every pesticide *that will ever be invented* already exists in some microbe in some field, somewhere in the world (simply because there are so many individuals of each species**). **Currently there are insects resistant to every synthetic chemical insecticide POISON now being used/misused! Even if they were "safe" – they are not as effective in controlling pest problems as the Author's safe and far more effective alternatives!**

HOW ABOUT "FRANKENFOODS" OR GMOS – DO THEY HELP?

You should only eat organic, grass-fed meat/beef because animals raised in confined animal feeding operations (CAFOs; are given unnatural inferior feed loaded with antibiotics (i.e. grains; instead of grass, and most of it genetically engineered at that), along with a variety of veterinary drugs. Many of these drugs are administered for prophylactic purposes to prevent illness, and others are given as growth promoters. **The average American eats more than 150 pounds of genetically engineered food every year.** If you're Monsanto, you're probably really proud of your genetically modified (GMO) sugar beets. Introduced in 2008, the beets are the company's most recent Roundup Ready product genetically engineered to withstand the direct application of the herbicide glyphosate. Immediately successful, they took over the sugar beet market within two years. By 2010, 95% of all the sugar beets grown in the U.S,A. were Monsanto's genetically modified variety and about 50 percent of white sugar sold in USA is made from sugar beets. In other words, unless that bag of sugar you just bought is labeled "Certified Organic" or "100 percent cane sugar," it almost certainly contains sugar made from GMO crops. **This despite the fact that scientists – the independent ones – agree that GE foods are ruining our health and our environment**!

Los Angeles proposes banning genetically modified organisms. Los Angeles is considering banning the cultivation and sale of genetically modified organisms. If it does, the second-largest U.S. city would become the country's largest GMO-free zone. Huffington Post - huff.to/1602QZJ

There is a report from Minnesota Public radio (MPR) on the damage rootworms are doing to the current corn crop and the very real concern farmers have that Monsanto's GMO seeds are no longer helping them control their pest infestations. The EPA is treating these latest reports seriously; according to the article, EPA officials visited some "problem fields" to observe possible evidence of rootworm resistance while awaiting results from Monsanto's own scientists. One pest expert MPR interviewed, Bruce Potter of the University of Minnesota, spoke more directly about the threat posed by rootworms, which appeared to have been previously held at bay by GMO corn until now. "We're not going to make this go away … We're stuck with managing this problem," he told MPR. The report continues: Potter has seen what he calls a "ridiculous" increase in rootworms apparently unfazed by the

usually deadly protein [in GMO Bt seeds] in southern and western Minnesota this summer.

Potter also spoke at a workshop held on a farm experiencing rootworm resistance, where he said that Monsanto Bt seeds are "basically backfiring." "Instead of making things easier, we've just made corn rootworm management harder and a heck of a lot more expensive," Potter said. Of course, this story was about the summer of 2012, so a story about farmers in the Midwest wouldn't be complete without a reference to the drought then. And guess what? Droughts enhance and amplify the damage corn rootworms exact on crops: In fields with a rootworm problem, the bug damages the cornstalk's ability to absorb water just when it's needed most. With the roots weakened, the plant can also be more vulnerable to wind. Charlie Sandager, who hosted the workshop on his farm near the town of Hills in southwest Minnesota, said he learned last summer just how seriously rootworms can damage corn's ability to stand. "A strong wind came up and it just tipped the corn plants over like a big old tree," Sandager said.

The sad irony is that farmers don't need to transform themselves into organic farmers to keep their crops from being worm food — though that may be the best approach for developing more drought-tolerant fields. Historically, farmers managed corn rootworms through traditional crop rotations. These rootworms eat corn exclusively, so by simply alternating a corn crop with soy or another alternative, farmers would deprive the resistant insects of food and the rootworm larvae would die off. This, by the way, is an age-old technique (originally part of the Native American Three Sisters agricultural tradition) that generates profits only for the farmer — not for seed companies. Indeed, this abandonment of crop rotation was the other "innovation" of Monsanto's Bt corn — aside from releasing its own pesticide POISON, that is. Farmers could now grow GMO corn season after season in the same field. At the time, it seemed like an amazing development to farmers across the country — and remains so today only to starry-eyed, tech-loving politicians and industry representatives.

Pesticide POISON use is skyrocketing across the Midwestern U.S. corn belt, as biotech companies like Syngenta and AMVAC Chemical watch their pesticide POISON sales spike 50 to 100 percent over the past two years, NPR reported. The culprit? Bt corn—a type of genetically engineered corn with insecticide POISON built into its genes. Variations of this corn strain—peddled across the world by large multinationals including Monsanto and Syngenta—are giving rise to Bt resistant insects and worms, studies show. **NPR reports that**

‘pests’ are decimating entire cornfields across Illinois, Iowa, Minnesota and Nebraska. Yet, now that the targeted insect killings are not working, big agribusiness is simply throwing more pesticide POISONS at the problem instead of moving away from these expensive GMOs. www.blacklistednews.com/Pesticide…0/Y/M.html

October 11th, 2013 - www.foodfirst.org/en/GMO+corn+banned+in+Mexico - **Mexican judge rules that GMOs are imminent threat - Monsanto and Pioneer must stop selling GM seeds in Mexico (edited).** A federal judge has ordered Mexico's Secretary of Agriculture, and SEMARNAT (which is equivalent to the EPA) to immediately "suspend all activities involving the planting of transgenic corn in the country and end the granting of permission for experimental and pilot commercial plantings". Judge Verdugo wrote the opinion and cited "the risk of imminent harm to the environment" as the basis for the decision. The judge's ruling also ruled that multinationals like Monsanto and Pioneer are banned from the release of transgenic maize in the Mexican countryside" as long as collective action lawsuits initiated by citizens, farmers, scientists, and civil society organizations are working their way through the judicial system. The judge's decision reflects a commitment to respect the Precautionary Principle expressed in various international treaties and statements of human rights. This ruling marks a milestone in the long struggle of citizen demands for a GMO-free country. The class action lawsuit is supported by scientific evidence from studies that have documented the contamination of Mexico's native corn varieties by transgenes from GMO corn, principally the varieties introduced by Monsanto's Roundup ready lines and the herbicide-resistant varieties marketed by Pioneer and Bayer CropScience.

Also in October, 2013, the city council of Kaua'i, Hawaii **slapped down Monsanto** with huge new restrictions. This is a major victory that the biotech industry fought tooth and nail, using every dirty trick in the book. Here's the amazing announcement about a **victory against GMOs** in Hawaii.
www.naturalnews.com/042545_Kauai_measure_2491_GMOs.html

Socio-Economic Impact of GM Corn in the Philippines

A study on the "Socio-economic Impact of Genetically Modified Corn in the Philippines" has been published by MASIPAG, a network of farmers' groups, scientists and NGOs in the Philippines.

The findings show how crucial it is for socio-economic considerations to be made an essential component in all biosafety assessments and decision-making processes. Some of the key findings and conclusions highlighted in the book include the following:

1) In 2000, farmers were enticed by the introductory price of GM corn which was almost on par with the regular hybrid corn. For example, in Cuartero, Capiz, the Roundup Ready (RR) GM corn first cost PHP 2,800 for an 18 kg bag but this shot up in 2008 to PHP 4,600 for a 9 kg bag. The prices of fertilizers and pesticides also increased.

2) Farmers turned to traders and money-lenders for credit/loans with interest rates ranging from 20–40%. They then also had to sell their produce to the same traders at lower than market prices. Most traders would not lend to farmers unless they grew GM corn.

3) As the promised resistance to pests and tolerance to herbicides decreased over time alongside growing incidence of natural disasters and calamities, farmers faced increasing poor harvests and incomes, leading them to take more loans.

4) External inputs (seeds, fertilizers, pesticides) comprise 40–48% of the GM corn farmers' total expenses per cropping season.

5) Self-financed small-scale GM corn farmers can earn from PHP 1,225.00 to PHP 19,160.00, but losses can be as high as PHP 6,611.00 and all earnings are practically cancelled out because of the costs of production, food, tuition and other necessities, almost all of which are covered through loans.

6) Farmers who are not able to pay their creditors are usually forced to leave, lease or give up their land in order to avoid legal action.

7) Local corn traders have played a key role in the proliferation of GMOs and changes in the structures of ownership and control over land, natural and genetic resources as a result of GM corn production.

The study was conducted from February to March 2012 involving 166 corn farmers, community leaders, local and national government officials, municipal agriculturists and Department of Agriculture regional officials. It spanned 12 *barangays* (districts) and seven GM corn-producing provinces. For more

information on the book, go to www.masipag.org.

Argentines link health problems to agrochemicals - www.newsdaily.com/article/83a868f54fcc4aac5c6485b4217a0bb9/argentines-link-health-problems-to-agrochemicals.

Argentina Is Using More Pesticide POISON Than Ever Before. And Now It Has Cancer Clusters. www.motherjones.com/tom-philpott/2013/10/argentina-cancer-cluster-pesticide.

Health Risks of GM Foods - Evidence of reactions in animals and humans

When rats were fed potatoes engineered to produce their own insecticide. The rats developed potentially precancerous cell growth in the digestive tract, inhibited development of their brains, livers and testicles, partial atrophy of the liver, enlarged pancreases and intestines and immune system damage. The cause was not the insecticide POISON, but in all likelihood was the process of genetic engineering. GM foods on the market—which were created with the same process—have not been subject to such an extensive testing protocol.

When rats were fed the GM FlavrSavr tomato for 28 days - seven of 20 rats developed stomach lesions (bleeding stomachs); another 7 of 40 died within two weeks and were replaced in the study. The tomato was approved despite unresolved safety questions by FDA scientists.

When rats were fed Monsanto's Mon 863 Bt corn for 90 days, they showed significant changes in their blood cells, livers and kidneys, which might indicate disease. Although experts demanded follow-up, Monsanto used unscientific, contradictory arguments to dismiss concerns.

When mice were fed either GM potatoes engineered to produce the Bt-toxin or natural potatoes spiked with Bt-toxin - both diets created abnormal and excessive cell growth in the lower part of their small intestine (ileum). Similar damage to the human small intestine might result in incontinence or flu-like symptoms, and may be precancerous. This study overturns the assumptions that Bt-toxin is destroyed during digestion and is not biologically active in mammals.

When workers were exposed to Bt cotton, they developed allergies. Agricultural laborers in six villages who picked or loaded Bt cotton reported reactions of the skin, eyes and upper respiratory tract. Some laborers required hospitalization. Employees at a cotton gin factory take antihistamines every day. One doctor treated about 250 cotton laborers

After the GM cotton harvest in parts of India, sheep herds grazed continuously on Bt cotton plants. Reports from four villages revealed that about 25% of the sheep died within a week. Post mortem studies suggest a toxic reaction.

In 2003, approximately 100 people living next to a Bt cornfield in the Philippines developed skin, respiratory, intestinal reactions and other symptoms while the corn was shedding pollen. Blood tests of 39 people showed an antibody response to Bt-toxin, which supports—but does not prove—a link. The symptoms reappeared in 2004 in at least four other villages that planted the same corn variety. Villagers also attribute several animal deaths to the corn.

More than 20 farmers in North America report that pigs fed GM corn varieties had low conception rates, false pregnancies or gave birth to bags of water. Both male and female pigs became sterile. Some farmers also report sterility among cows.

Twelve dairy cows died on a farm in Hesse Germany, after being fed a diet with significant amounts of a single GM corn variety, Bt 176. Other cows in the herd had to be killed due to some mysterious illness. Syngenta, the producers of Bt 176, compensated the farmer for part of his losses, but did not admit responsibility for the cow deaths. In spite of demands by the farmer and even public protests, no detailed autopsy reports were made available.

The liver cells of mice fed Roundup Ready soybeans showed significant changes. Irregularly shaped nuclei and nucleoli, an increased number of nuclear pores and other changes, all suggest higher metabolism and altered patterns of gene expression. The changes may be in response to a toxin. Most of the effects disappeared when GM soy was removed from the diet.

Mice fed GM soy showed changes in the synthesis and processing of digestive enzymes. The production of alpha-amylase, a major digestive enzyme, dropped by as much as 77%. This, combined with other pancreatic changes, suggests that GM soy may interfere with digestion and assimilation, as well as alter gene expression.

Mice fed Roundup Ready soy had unexplained changes in testicular cells. The structure and gene expression pattern of testicle cells of mice fed Roundup Ready soybeans changed significantly. The cause for the changes is unknown, but the testicles are sensitive indicators of toxins. Some of the changes might possibly influence adult fertility as well as the health of the offspring. Mouse embryos from GM-fed mothers did show a temporary decrease in gene

expression.

Rabbits fed GM soy for about 40 days showed significant differences in the amounts of certain enzymes in their kidneys, hearts and livers. A rise in LDH1 levels in all three organs suggests an increase in cellular metabolism. Changes in other enzymes point to other alterations in the organs.

Most offspring of rats fed Roundup Ready soy died within three weeks - Female rats were fed Roundup Ready soy starting before conception and continuing through pregnancy and weaning. Of the offspring, 55.6% died within three weeks compared to 9% from non-GM soy controls. Some pups from GM-fed mothers were significantly smaller and both mothers and pups were more aggressive. In a separate study, after a lab began feeding rats a commercial diet containing GM soy, offspring mortality reached 55.3%. When offspring from GM-fed rats were mated together, they were unable to conceive.

Soy allergies skyrocketed in the UK, soon after GM soy was introduced - in a single year, 1999, soy allergies in the UK jumped from 10% to 15% of the sampled population. GM soy was imported into the country shortly before 1999. Antibody tests verify that some individuals react differently to GM and non-GM soy varieties. GM soy also has an increased concentration of a known allergen.

Rats fed Roundup Ready canola had heavier livers - the livers of rats fed GM canola were 12-16% heavier than those fed non-GM varieties. The liver is a chemical factory and primary detoxifier for the body. Heavier livers may indicate liver disease or inflammation. If this were caused by oil-soluble toxins, they may be present in canola oil.

Twice the number of chickens died when fed Liberty Link corn - the death rate for chickens fed Chardon LL GM corn for 42 days was 7%, compared to 3.5% for controls. GM-fed chickens also had more erratic body weight and food intake, and less weight gain overall. The study was designed so that only huge differences would be statistically significant. The results were therefore dismissed without follow-up.

GM peas generated an allergic-type inflammatory response in mice. In advanced tests not normally part of GM crop evaluations, protein produced by GM peas generated a dangerous immune response in mice. That "same" protein, when produced naturally in beans, had no effect. The GM peas produced a subtle, hard-to-detect difference in the way sugar molecules attached to the protein, which likely caused the problem. The response in mice suggested that the GM peas could provoke inflammatory or allergic reactions in humans; commercialization of the peas was therefore cancelled. This type of subtle but

dangerous change in the GM protein would rarely, if ever, be detected in the safety assessments typically used to approve GM crops.

Many Animals avoid GMOs - When given a choice, several animals avoided eating GM food. In farmer-run tests, cows and pigs repeatedly passed up GM corn. Animals that avoided GM food include cows, pigs, geese, squirrels, elk, deer, raccoons, mice and rats.

A GM food supplement killed about 100 people and caused 5,000-10,000 to fall sick - One brand of the supplement L-tryptophan created a deadly US epidemic in the 1980s. The company genetically engineered bacteria to produce the supplement more economically. Their product contained many contaminants, five or six of which were suspected as the cause of the disease. Discovering the epidemic required multiple coincidences, suggesting that adverse reactions to GM foods may be hard to identify. www.responsibletechnology.org/gmo-dangers/65-health-risks/1notes

Forty percent of consumers believe that unlabeled genetically engineered foods and crops are unsafe. Another 40 percent are unsure. These numbers terrify large supermarket chains, biotech companies and food corporations. So does the notion that states such as Washington, Connecticut, Maine and Vermont will soon require mandatory labeling of GMOs, which will likely drive these controversial foods and crops off the market, just as labeling laws have already done in Europe. **Over 100 million U.S. consumers are now regularly shopping for organic and natural foods, nutritional supplements and other products, giving rise to a rapidly growing $80 billion-a-year market for organic and natural products.**

Please see: www.ensser.org/increasing-public-information/no-scientific-consensus-on-gmo-safety/ and please read: **Sources and Mechanisms of Health Risks from Genetically Modified Crops and Foods** - www.biosafety-info.net/file_dir/72127018552830096d4e5c.pdf

On Thursday 11/7/13, the Food and Drug Administration (FDA) announced that it is moving toward significantly limiting–more or less banning–trans fats from foods in the U.S. The agency has finally decided that trans fats are not safe for human health, and shouldn't be in foods we eat. So what are they? **Trans fats are a byproduct of partially hydrogenated oils (PHOs).** By bubbling hydrogen gas through oil under certain conditions, manufactures can turn liquid oils into whatever saturation or thickness that they desire. Such partially hydrogenated oils have become popular because they give foods taste and texture, and in the 1950s, trans fats emerged as a way to increase the shelf

life for processed foods such as baked goods. However, they have also been linked to major health problems such as coronary heart disease, **since trans fats (not saturated fats) build up plaque in the arteries that can contribute to a heart attack. In 1999, the FDA first proposed that manufacturers disclose the amount of trans fat on nutrition labels but that did not become a requirement until 2006. Now finally, after reviewing studies on trans fats, the FDA issued a Federal Register notice, which is preliminarily determination that PHOs are no longer "generally recognized as safe" (GRAS).**

In 1993, 1 in 7 Americans got cancer. We have spent many billions of dollars on cancer research (a river of gold); yet now 1 out of every 2 Americans will get cancer and in the near future, breast cancer will be the #1 killer and prostate cancer will be the #2 killer of Americans! In the 1990s, one in eight women got breast cancer. From 1960 to the 1990s, more than 950,000 died from breast cancer - almost half of these deaths had occurred in the last 10 years! **Putting this in perspective - only 617,000 Americans have died in all the wars our country fought last century**! Unless we want to see the demise of our own race, we must stop releasing tons of virtually untested, unstable, synthetic pesticide poisons that are creating a synergistic contamination that no one can honestly say they can truly assess all of the human health risks for and which still does not even control our pest enemies! Some of the so called "inerts" can continue to contaminate for much longer than the active poison ingredients, e.g., **some *inerts* have a half-life of greater than 880 years!**

Yet, the U. S. annually now blasts itself with about 4.5 billion pounds of volatile, synthetic pesticide poison which, obviously, provide fewer and fewer "benefits". By 1964, 2/3's of all U. S. insecticide POISONS were used on only 3 crops: cotton, corn, and apples per the Mrak Commission (In 1969, the U. S. Department of Health, Education, and Welfare prepared a landmark report on the environmental health consequences of pesticide POISONS - The Mrak Commission). Pimental et. al., in Environmental and economic impacts noted that **despite a thousand-fold increase in the U. S. use of insecticide poisons on corn-losses to insects have an increased 400%!** Cornell University researcher, David Pimental in *Silent Scourge, Audubon,* Jan./Feb. 1997 estimates that of the roughly 672 million birds annually exposed to pesticide POISONS in the U. S. - 10% - (at least) 67 million - of our bird allies are killed annually! (Note: Back then, about 5 to 6 billion pounds of insecticides, herbicides, fungicides, rodenticides, and other biocide active POISON ingredients were yearly added to the world's environment.) The concepts of synthetic pesticide

resistance, pest resurgence and the development of secondary pest problems have been taught (and then ignored) in introductory science classes for literally decades! **Since synthetic pesticide poisons were introduced into agriculture at the end of World War II, total crop losses due to insect damage (despite a tenfold increase in insecticide poison) have almost doubled - from 7% in the 1940's, when all agriculture was essentially organic, to 13% by the end of the 1980's. In 1945 almost no insecticide poison use was used on corn and the USDA noted insect damage only averaged about 3.5%. In the 1990s, despite more than one thousand-fold increase in the use of synthetic insecticide poisons on corn, losses to insects then averaged 12%!** Entomological Journals are filled with pesticide resistance problems developing all over the world - obviously, synthetic pesticide POISONS quickly create resistant or immune pests. **The Author's safe and far more effective Pestisafes® can not and do not create resistant or immune pest species and can be applied in a way that does not harm/destroy the beneficial insects!**

In the 1990s approximately 5% of all farms controlled over half of the Nation's agricultural production and our smaller farmers were already going out of business by the thousands, all while economic consolidations using mergers, takeovers, and conglomerations in the food and poison industry are being magnified a hundred-fold - we now are almost totally dependent on the poison industry - and their resulting contamination for our "food". In 1981, A. Robert Abbou'd as president of Occidental Petroleum, a giant energy corporation, spent $800 million to acquire Iowa beef processors and said "we're going to be running onto a food scarcity situation in the 1990's in the same way we have an energy shortage in the 1980's. We will continue to build in this area." **Occidental Petroleum also is known for its Hooker chemical subsidiary and Love Canal controversy/contaminations. A few multinational corporations and "banksters" now own the new "biotechnology" that is genetically altering or "modifying" all of our (hybrid) seeds, livestock embryos and/or other living organisms - shifting the ability to produce food from our farmers to the "scientists" and therefore to those that actually own them, their "science" and their chemical poisons and their patents - all at the expense of environmental safety, nutritional value, and biological diversity and therefore our future (altered) harvests - all are sacrificed on the corporate altar of expediency and profit** - yet we still are being told the same old propaganda/lies that there still is nothing to "worry" about - "Hold still please...Trust in me, just in me...Shut your eyes..." - the snake, Kaa, in *The Jungle Book*. We can no longer produce our own seed as farmers did since the

beginning of time. Genesis 1:12: "and the earth brought forth grass, and herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself, after his kind; and G-d saw that it was good." **Today we must look to greedy men and not G-d for our daily bread.**

Thousands of people each year report to poison control centers and emergency care clinics after being poisoned by "registered' pesticide POISONS. While statistics on pesticide poisonings are hard to come by because EPA fails to accurately track and document these, California does keep records. From 2000-2008 California alone had over 7,600 reported pesticide poisoning cases (individual people poisoned) resulting in almost 200 hospitalizations. About half of these were from agriculture uses, and half from non-agriculture uses such as homes, gardens, school yards, and golf courses. Children are likely to be more vulnerable to pesticide poisonings than adults because they spend more time close to the ground or floor where pesticides are applied, and their growing bodies, including the brain and reproductive organs, may be altered in long-term or permanent ways after being poisoned. These facts were identified in a 1993 report by the National Academies that concluded, **"depending on dose, some pesticide POISONS can cause a range of adverse effects on human health, including cancer, acute and chronic injury to the nervous system, lung damage, reproductive dysfunction, and possibly dysfunction of the endocrine and immune systems."**

Many of the pet flea and tick products sold in grocery, drug and pet supply stores, even when applied exactly according to the label, can cause serious health consequences to pets and humans. Organophosphates were initially designed as chemical warfare agents, specifically designed to kill and injure people. Exposure to organophosphate pesticides can cause dizziness, confusion, vomiting, convulsions, numbness in the limbs, and even death. They have also been linked to developmental delays, reduced IQ, and behavioral problems in exposed children. EPA has finally cancelled most home uses of organophosphates, reducing their annual use from about 90 million pounds to under 60 million pounds annually. **But they are still allowed on our food crops, and one is still allowed in pet flea and tick treatments.**

If the word has the suffix –cide in it, then you know it's meant to kill something. Homicide, suicide and/or pesticide they all KILL! Pesticide POISONS are designed to kill insects, fungus, bacteria and other things that feed on crops, are vectors for disease, nuisances, and things that destroy property. Farming is big business and some farming companies are bottom-line driven, in business to make money at any cost. Pesticide POISONS and genetically

modified organisms are one way to ensure they get the crop yield they demand, no matter how it hurts the environment or the consumers. **Seven of the most toxic chemical compounds known to man are approved for use as pesticide POISONS in the production of our foods!** Who approved them? A multinational organization called The Codex Alimentarius Commission (CAC). It was formed in 1963 from a cooperative effort between the World Health Organization (WHO) and the Food and Agriculture Organization of the United Nations (FAO). Their overall objective was "…to protect the health of the consumer and ensure fair practices." The intent of the original 172 nations involved in this effort was to develop a set of food guidelines, standards, and codes of practice. It was to be an international endeavor to promote safety in food**. In spite of their stated consumer protection responsibilities, the CAC approved toxic chemicals for use on our food crops. These toxins are referred to as Persistent Organic Pollutants (POP's). They're called persistent because they are not easily removed from the environment. The greatest risk to our environment and our health comes from the chemical pesticide POISONS.** In spite of all the known dangers, the government maintains its approval of the use of toxic chemicals to make pesticide POISONS. And the POISON producers are constantly developing toxic variations of poisons.

Pesticide POISONS are a major threat to bees. The systemic poisoning of flowers has killed scores of bees. We're simply losing too many of the bees. More than 25% of the bee colonies died in winter **2006/07**. That translates to a loss of tens of billions of dead bees. And it's estimated that this loss will negatively impact the agricultural economy to the tune of $8 to $12 billion. In August of 2013 the European Union moved to temporarily ban the use of three neonicotinoids: clothianidin, imidacloprid and thiamethoxam all of which are linked to declines in bee populations. This has been met with legal action from two of the largest agricultural chemical companies, Bayer and Syngenta,. They claim that the ban is "unjustified" and "disproportionate." But clear scientific evidence shows their products are behind the massive bee die-off that puts our entire food chain in peril. At the same time 37 million bees were discovered dead on a single Canadian farm. And unless we act now, the bees will keep dying. We have to show Bayer now that we won't tolerate it putting its profits ahead of our planet's health. If this giant corporation manages to bully Europe into submission, it would spell disaster for the bees and mankind's food supply.

Farmers and their families and other persons who use chemical pesticides regularly are at greatest risk for achieving toxic levels in their bodies. The

danger is spread out to larger areas, as the pesticide POISONS:

Are carried all over the earth on the wind

Contaminate produce

Remain inside produce and animals

Run off into open water, contaminating public water supply as well as fish and other seafood

Anyone who uses pesticide POISONS or is present when pesticide POISONS are sprayed is at risk for dangerous exposure. The pesticide POISONS can enter your body through skin, eyes, mouth and nose.

WHAT ARE THE DANGERS FROM PESTICIDE POISON EXPOSURE?

Pesticide POISONS can be toxic to humans and lower animals. It can take a small amount of some toxins to kill. And other toxins that are slower acting, may take a long time to cause harm to the human body. Pesticide POISON production can be dangerous, too. One disaster at a pesticide POISON manufacturing plant was in Bhopal, India. The plant accidentally released 40 tons of an intermediate chemical gas, methyl isocyanate, used to produce some pesticide POISONS. In that disaster, nearly 3,000 people were killed immediately, overall approximately 15,000 deaths occurred. Today nearly 100,000 people suffer from mild to severe permanent damage as a result of that single disaster.

Children seem to be greatly susceptible to the toxic effects of pesticide POISONS. The Natural Resource Defense Council has collected data which recorded higher incidence of childhood leukemia, brain cancer and birth defects. These results correlated with early exposure to pesticide POISONS. Even just using pesticide POISONS in amounts within regulation, studies have revealed neurotoxins can do serious damage during development. Researchers report the dangers of pesticide POISONS can start as early as fetal stages of life. The *Pesticides* entry at Wikipedia.org lists some of the results that have been recorded in recent years including:

Fetuses, (pre-birth babies), may suffer from exposure and exhibit behavioral problems, growth issues

Lower cognitive scores, fewer nerve cells and lower birth weight

A lower resistance to the toxic effects of pesticide POISONS

A greater risk (70% increase), for Parkinson's disease, even with low levels of pesticide POISONS

Several studies have shown a link between pesticide exposure and the onset of Parkinson's disease, Alzheimer's disease, as well as other neurological conditions such as epilepsy. The main path of exposure is airborne: breathing pesticide POISONS. Recently, UCLA researchers looked at Central Valley residents diagnosed with Parkinson's disease, and found that "years of exposure to the combination of these two pesticide POISONS [the herbicide paraquat and fungicide maneb] increased the risk of Parkinson's by 75 percent. Further, for people 60 years old or younger diagnosed with Parkinson's, earlier exposure had increased their risk for the disease by as much as four- to six-fold."

[ScienceDaily]. Pesticide POISONS can be detected miles from agricultural sites, can be detected in rainfall, as well as in the air. A study by the US Geological Survey in 2000 revealed that "**every rain and air sample collected from the urban and agricultural sites had detectable levels of multiple pesticide POISONS**. The magnitude of total concentration was 5-10 times higher at the agricultural site as compared to the urban site." In this study, methyl parathion was the pesticide POISON with highest concentration in both air and rain samples. **Additionally, even though two decades have passed since the 1973 ban of DDT in the US, a metabolite of DDT (DDE) was detected in every air sample collected from the agricultural site and in over half the air samples from the urban site!**.

Can you believe the government actually approved the use of some organophosphates despite the known occurrence of illnesses? It makes you wonder just who the Environmental Protection Agency (EPA) is working to protect. Obviously not the environment nor us. What you also need to understand is that toxins from pesticide POISONS can remain in your body and build up in your liver. And, even at "safe" levels your reactions can be mild to severe. High levels of exposure can be fatal. **How do you know if you're going to be ill? You don't; you just have to hope for the best. How will you be affected? Well, you don't really know how your body will react to the toxins until it happens**. Several factors determine how your body will react including your level of exposure, the type of chemical you ingest, and your individual resistance to the chemicals. Some people are unaffected or are mildly affected, while others become severely ill from similar levels of exposure. Some possible reactions are:

Anger/Irritation

Fatigue

Skin Irritations

Nausea/Vomiting

Heart Problems

Breathing Problems Brain Disorders

Blood Disorders

Liver & Kidney Damage

Reproductive Damage

Cancer

Death

Genetically modified (GM) crops and foods are the subject of intense, and at times furious, debate in the United States. Most of the country's corn and soy harvests now come from GM seed varieties patented by the Monsanto biotechnology corporation, and are used mostly to make food additives, biofuels, and fodder for farm animals. The introduction of these novel products into the US food supply in the 1990's, without any public debate, notification or hearings, environmental impact statement, or independent safety studies, is causing great concern among an increasing number of consumers. Biotech corporations claim that their GM crops provide countless benefits for consumers, farmers, the environment and the world's hungry, including reduced use of pesticide POISONS, high yields, and environmentally sound weed and pest management. For the future, they promised crops with increased nutritional content for the hungry in the third world- like the famous "golden" rice-, and "climate-ready" crops that will resist the extreme weather events linked to global climate change. But there are many scientists, farmers, activists and citizens that dispute these claims and rosy scenarios, and question even whether these foods are safe at all, and whether the underlying scientific assumptions of the technology of genetic engineering are valid in light of the most recent developments and discoveries in the fields of genetics and genomics. **What really has occurred is that many GMO crops have become more pesticide resistant and have actually encouraged the increased use of pesticide POISONS like Monsanto's Roundup!**.

South America is the world's second largest GM crop producer, trailing close behind its northern neighbors, the USA and Canada. All in all, almost all of the world's GM harvest is in the Western hemisphere, with only five nations taking the lion's share: the US, Canada, Brazil, Argentina and Paraguay. According to the biotech industry, GM crops in Latin America are a success story: the farmers have reduced costs and increased revenues, and these exports provide much needed foreign exchange for their countries. But according to civil society organizations working on the ground, the introduction

of GM crops in Latin America has been an unmitigated disaster. In May 2013, 30 members of 12 organizations, convened by the Network for a GM-Free Latin America (RALLT) met in the Colombian city of Bogotá, to share and analyze information on the social and environmental impacts of biotech crops, 17 years after their introduction**. "Far from fulfilling the promises that the companies once made to enter the region, GM crops have planted desolation and death in Latin America",** denounced the meeting's participants in an open letter addressed to top officials of the United Nations. "The companies that produce seeds and pesticide POISONS and trade GM food together with local elites and in complicity with the government in office have turned Latin America into a maquila of GM crops**... The impacts of their activities have been: genetic contamination of agricultural biodiversity, destruction of natural ecosystems, subjecting the population to health problems due to the extensive use of pesticide POISONS, close to genocide**. Thus, in the Southern Cone, glyphosate resistant soybeans cover an area of 475,700 Km2. This whole area is sprayed with a cocktail of pesticide POISONS including glyphosate, affecting millions of people living not only in the main spraying area but also in its buffer zone**." The signatories emphasize that these impacts are so extreme that they need to be viewed as massive human rights violations.**

The human health impacts of this agrochemical-intensive farming have been particularly dramatic in Argentina. In August 2010 Argentina held its First National Encounter of Medics of Fumigated Towns, in which participating scientists, researchers, and academics wrote an open letter to agribusiness trade associations, from which the Author quotes: **The cancers and other severe illnesses are detected with more frequency now. As well as miscarriages, disruptions of fertility and the birth of children with birth malformations, which we find in very elevated rates. And respiratory, endocrine, hematological, neurological and psychic ailments are, also now, much more frequent in the systematically fumigated populations.** Fumigated because they share the same geographic space as the agroindustrial and genetically engineered crops that you yourselves exploit.... We, the doctors and other members of the health teams, the researchers, scientists and academics that analyze this problem, are certain that the increasing health ailments in the inhabitants of the fumigated towns are caused by the fumigations that you yourselves carry out. The Grupo de Reflexión Rural (GRR), an Argentine NGO that is critical of GM crops and industrial agriculture, has been documenting these horrors for years:

Some time ago, the Grupo de Reflexión Rural (GRR) took on the task of

collecting information about the impacts of glyphosate on diverse Argentine populations: among other places, in the Ituzaingo neighborhood in Cordoba; Las Petacas, in Santa Fe; in San Lorenzo, also in Santa Fe; and Los Toldos in Buenos Aires. In each of these populations dramatic situations were detected. And precisely in the Ituzaingo neighborhood... over two hundred cancer cases in a population of hardly 5,000 inhabitants, as well as deformations among the newborn. Ituzaingo is a population surrounded by soy fields that are systematically fumigated. The spray from these fumigations arrives at the doors of the houses. It is not an exaggeration to state that glyphosate's health effects were covered up for years. In June 2011 an international group of scientists and researchers, organized as Earth Open Source, published a report titled "Roundup and Birth Defects: Is the Public Being Kept in the Dark?" **The document says that as early as the 1980's Monsanto knew that Roundup's glyphosate caused birth defects in laboratory animals; that the German government had this information at least since 1998**; and, to quote from the report's press release:

The German government has known about these findings since at least the 1990s, when as the 'rapporteur' member state (of the European Union) for glyphosate, it reviewed industry's studies for the EU approval of the herbicide. The European Commission has known since at least 2002, when it signed off on glyphosate's approval. But this information was not made public. On the contrary, regulators have consistently misled the public about glyphosate's safety. As recently as last year, the German Federal Office for Consumer Protection and Food Safety, BVL, told the Commission there was "no evidence of 'teratogenicity' (ability to cause birth defects) for glyphosate.

There are alternatives to the industrial mode of agriculture, with its toxic agrochemicals and GM crops. And these alternatives can be found in the young science of agroecology. Agroecology is a scientific discipline that uses ecological theory to study, design, manage and evaluate agricultural systems that are productive but also resource conserving. Agroecological research considers interactions of all important biophysical, technical and socioeconomic components of farming systems and regards these systems as the fundamental units of study, where mineral cycles, energy transformations, biological processes and socioeconomic relationships are analyzed as a whole in an interdisciplinary fashion.

This new field is simultaneously a science, an agricultural practice and a social movement, and began in Central America in the 1970's and 80's with the Campesino a Campesino (peasant to peasant) movement. Campesino a

Campesino, which has now spread all over the world, is an innovative participatory and horizontal farmer-to-farmer learning method that owes much to liberation theology's methodology of critical thinking and social action, and to Brazilian educator Paulo Freire's pedagogy of the oppressed. It can be better thought of as an ecology of the poor, or as a campesino ecology. "Agroecological methods produce more food on less land, using less energy, less water while enhancing the natural resource base, providing ecological services and lowering outputs of greenhouse gases", according to a paper by the Latin American Scientific Society of Agroecology (SOCLA) whose main author is SOCLA president and UC Berkeley professor Miguel Altieri. The paper, which was presented at the Rio +20 United Nations Sustainable Development Summit in Brazil in 2012, cited a 2006 study by the University of Michigan directed by Puerto Rican professor Ivette Perfecto, that **compared yields of organic versus conventional agricultural production from a global dataset of 293 examples and arrived at results that were very favorable to organic production**. "This means that the global south has the agroecological potential to produce enough food on a global per capita basis to sustain the current human population, and potentially an even larger population, without increasing the agricultural land base." **Latin America, is possibly the one region of the world that has been the most adversely affected by industrial GM export-oriented agriculture is also a world leader in offering sustainable and ecologically sound farming alternatives**.

Biofortification uses safer conventional plant-breeding methods to enhance the level of micronutrients in food crops through a merging of laboratory and agricultural techniques. The goal is to defeat micronutrient deficiencies, which can cause severe health problems such as anemia, blindness, impaired immune response and development delays. According to the UN Food and Agriculture Organization, micronutrient malnutrition affects 2 billion people globally. Agriculture scientists in Brazil have spent the past ten years developing so-called "superfoods" that will soon become a natural alternative to GMO frankenfoods grown in many countries including the United States and could alleviate malnutrition for nearly one-third of the world's population. Eight biofortified foods are expected to be easily available to families throughout Brazil in less than a decade; already there is a pilot program starting in 15 municipalities around the country, Britain's *Guardian* newspaper reported.

YOU OBVIOUSLY DO NOT NEED TO USE ANY GMOS OR PESTICIDE POISONS!

The clarity of Sun Tzu's thought is still acted upon by Chinese generals of today; it is "The supreme art of war is to subdue the enemy without fighting." This supreme art is what the Author has continually developed upon in his intelligent pest management® manuals, *The Best Control*© and *The Best Control II*© (www.stephentvedten.com/index.htm) and this little book. The Author, like Sun Tzu, believes "The skillful strategist should be able to subdue the enemy's army without engaging it, to take his cities without laying siege to them, and to overthrow his State without bloodying swords". One of Sun Tzu's admirers was Mao Tse Tung - in Chiang Kai - Shek's army - most of the younger officers considered Sun Tzu's thoughts to be out-of-date and hardly worth study in the era of mechanized weapons. Chairman Mao Tse-Tung disagreed with his enemy and in May, 1928 wrote "on protracted war", selected works Vol. II page 156 that "**The object of war is specifically to preserve oneself and destroy the enemy"** (to destroy the enemy means to disarm him or "deprive him of the power to resist", and does not mean to destroy every member of his forces physically.). This "truth" taken from the "Little Red Book", contains the essence to true IPM. **To use toxic, volatile poisons that do not preserve us, but rather destroy our own people, pets, and natural allies without even diminishing, much less destroying our pest enemy, but which in truth actually preserve our pest enemy and even prosper our pest enemy is to insure the annihilation of those living things (including yourself) you are trying to protect and preserve with useless POISON!**

All of the guiding principles of military operations grow out of this one basic principle: to strive to the utmost to preserve one's own strength and destroy that of your enemy... **to release nerve gases, hormonal disrupters, carcinogens, mutagens, etc. (poisons) into or onto one's own person, ambient air, food, or water is to insure our own eventual defeat or destruction - while preserving that of our resistant pest enemies, and totally ignores the basis of all successful military principles!** The communist Chinese Red Army defeated General Chiang Kai-Shek using this very principle and Mao noted that "without preparedness - superiority is not real superiority and there can be no initiative either. Having grasped this point, a force which is inferior, but prepared can often defeat a superior enemy by surprise attack." I warn you our "inferior" pest enemy is already resistant to our "superior' pesticide POISONS and is already attacking us and is winning the war - common sense (which is not too common) and the use of true IPM as detailed in the Intelligent Pest Management® manual, *The Best Control*©, *The Best Control II*©

(www.stephentvedten.com/index.htm) and this little version will yet turn the tide in our favor.

The purpose of True Integrated Pest Management or Intelligent Pest Management® or Imaginative Pest Management or Innovative Pest Management (IPM) or Ecologically Based Pest Management (EBPM) is to render an area more or less permanently uninhabitable for the pest - in as environmentally safe a manner as possible...often it does not even destroy the pest. Rather than simply trying to control pests temporarily at best, using volatile, synthetic pesticide poisons which are very harmful to people, pets and the environment, IPM is dedicated to removing the causes rather than treating the symptoms. Passive IPM is simply allowing natural programs, predators, climate and controls to remain in place. Active or true IPM can be easily understood if you can relate the pest's needs to your own needs and home. If you came home and found every room of your home was filled with foam or concrete (caulking) or that your home had been altered so that your heating/air conditioning were not working or were removed (temperature changes) all the locks changed and/or all windows and doors were boarded over (exclusion) and/or steel bars were installed over all windows and doors (screening) all plumbing, gas and electricity lines removed, all water, food supplies, clothing, furniture and beds either removed or secured in such a way you could not gain access (sanitation and habitat reduction) to your own home or even the things you need to survive you would move - if you still did not move the police would come and take you away (vacuums and/or traps). **You now can understand how we will use true IPM techniques to permanently eliminate all of the conditions conducive to any pest infestation and, thus, any pest. All of us are capable of waging war on pests, directly or indirectly, especially using these safe and far more effective Pestisafes® and common sense**.

What we must first understand is our enemy - his exact location, weaknesses, strengths, habits and preferences. Remember to remove the cause rather than treat the symptom. If you avoid the use and misuse of poison, you will avoid resistance and contamination problems, conserve beneficials, the environment and yourself. Robert Metcalf, an entomologist, said, "The greatest single factor in preventing insects from overwhelming the rest of the world is the... warfare which they carry out among themselves". Remember the old childhood riddle: The enemy of my enemy, is a friend of mine? Rachael Carson said, "The second neglected fact is the truly explosive power of a species to reproduce once the resistance of the environment has been weakened". **The greatest weapon you have is your imagination - never depend on any one**

tool other than your brain and always seek a better, safer way! Even if the first tool does not work - there are many, many others that will! Seek out knowledge with the same desire - you seek out the source and/or the pest - This book will always need continual revision - there always will be one more safe, alternative pest control to try - rather than any dangerous, volatile pesticide POISON! True IPM is not an acronym for "Include Pesticides Monthly" or "Increase Pesticide Marketing" or "Integrated Pesticide Management" - it stops the terrible poison "game" that the Author calls environmental roulette and it safely and far more effectively stops the pests!

ECOLOGICAL NARCOTICS - The use of volatile, synthetic pesticide poisons to "control or eliminate" pests is, obviously, not working. With any chemical dependency, routine use invariably makes worse the very problem it will supposedly eliminate, correct, control or fix. Using volatile pesticide poisons has not only created resistant pests, it has actually increased their numbers and their damages and the severity of their attacks. Trying to drown one's sorrows in alcohol only creates bigger problems and greater sorrows and then even greater dependency and greater sorrow and problems. It's time to get clean and sober! **The definition of True IPM: Intelligent Pest Management® (IPM) is the coordinated use of pest and environmental information with available pest management methods to prevent unacceptable levels of pest damage by the most economical means, and with the least possible hazard to people and the environment. The goal of true IPM approach is to manage pests and the environment so as to balance costs, benefits, human health and environmental quality. True IPM systems utilize a high quantity and quality of technical information on the pest and its interaction with the environment (site). Because true IPM programs apply a holistic approach to pest management decision-making, they take advantage of all low risk management options, emphasizing natural biological methods, and the appropriate use of selective Pestisafes® and, as a last resort, selective, non-volatile, pesticides. True IPM's strategies incorporate environmental considerations by emphasizing pest management measures that minimize intrusion on natural bio-diversity ecosystems. There are many alternatives to volatile, synthetic pesticide POISONS**

Thus, true IPM is:

A system utilizing multiple methods that will not create resistance,

A decision-making process,

A risk reduction system,

Information intensive,

Biologically based,

Safety conscious,

Cost effective,

Site specific and uses many alternatives to volatile, synthetic pesticide poisons.

BREAKING THE CYCLE OF VIOLENCE - LEAGUE OF WOMEN VOTERS

In our concern about "Breaking the Cycle of Violence," we do not want to overlook the neurotoxic and hormonal effects from many of the man-made chemicals that we are spewing into our environment. For example, "a very large proportion of all the pesticide POISONS used today are neurotoxic." In experimenting with rats, **Professor Warren Porter of the University of Wisconsin, Madison has found that tiny doses of combinations of pesticides (poisons), at levels that can be found in Wisconsin drinking water today, can cause both aggression and learning problems in the rats.** He states, "**Can you imagine any parents exposing their children to a toxic chemical? And yet they do it all the time [by pesticiding their homes and gardens, eating pesticided food, and permitting pesticiding in their children's schools and on their playgrounds]. The telling comparison is that we protect laboratory rats better from this stuff than we do our kids."** He said, "We will not be able to maintain a highly-ordered technological society if we raise a generation of children who are learning disabled and hyperaggressive." Many synthetic chemicals disrupt our hormones. Tiny doses can have devastating effects on the fetus, lasting a lifetime. Even although the genetic makeup of the individual can remain unchanged, the affected hormones control which genes will actually be expressed and in what way. Concerning these effects of man-made chemicals, the authors of Our Stolen Future write: "Wildlife data, laboratory experiments, the DES [a synthetic estrogen] experience, and a handful of human studies support the possibility of physical, mental, and behavioral disruption in humans that could affect fertility, learning ability, aggression, and conceivable even parenting and mating behavior. **To what extent have scrambled [hormone] messages contributed to what we see happening around us - the reproductive problems seen among families and friends, the rash of learning problems showing up in our schools, the disintegration of the family and the neglect and abuse of children, and the increasing violence in our society?"**

Every day, 49 million children attend school in the United States, served by nearly seven million teachers and staff. But they're not alone. Schools are also frequented by a number of pests including cockroaches, mice, dust mites and more. Asthma is epidemic among children, impacting nearly 6% of school children nationally with rates as high as 25% in urban centers. Cockroaches are potent asthma triggers. True Integrated Pest Management (IPM) is a prevention-

based, highly effective approach proven to reduce pest complaints and pesticide use by up to 100% in schools and other public buildings. IPM practices such as sanitation and exclusion also improve food safety, fire safety and energy conservation. **The Author removed all the pest problems inside and outside in over 380 schools without ever using any volatile pesticide POISONS!**

Michigan Living, March 1998, Volume 80, No. 6, noted that studies at AAA show the number of aggressive driving incidents has risen 51% since 1990. This study specifically measured only the number of times a driver tries to kill or injure another after a traffic dispute. The study did not note the increased amount of verbal abuse or obscene gestures which we now all have to deal with daily. Helen Keller was once asked, "Is there anything worse than not having your sight?" She responded earnestly, "Oh, yes; it would be much worse to have your sight but not to have vision!" **Enough of the problems - On with the answers and the vision!**

When it comes to bites and stings - prevention is your best medicine. What can you do? First, learn which creatures can bite or sting. Next, understand what you can do to avoid a problem. Last, know what to do and whom to call if you get bitten or stung.

How toxic are the venoms of stinging ants, bees and wasps? As Justin Schmidt noted: The sting of a tiny fire ant, which weighs in at about three billionth of an ounce, can have a terrific impact on a huge person that weighs about 10 million times as much as the ant. About 70,000 species of Hymenoptera (ants, bees, wasps, etc.) can sting. I like to note only the females can sting you. We are all different and unique so we may only experience a little pain, or we may experience extreme pain and allergic reaction. **Avoid being stung if at all possible!** How many Texans have felt the "sting" of fire ants? A Winter 2000 poll conducted 2/9-25/00 by the Scripps Howard Data Center noted 79% of all polled Texans had been stung by fire ants and a majority of the residents had been treated for them in the past year. West Texans were least likely to have been stung (61%) as opposed to Central Texans (90%). Eastern Texans had been stung 89%, Southern Texans were stung 78% and 72% of Northern Texans that were polled noted they had been stung by fire ants. Of the Texans over 60 years old that were stung, 68% were treated, as compared to 37% of the 18 to 29 year olds that were stung by fire ants. Among those treated for fire ant stings, 51% were treated 4 or more times. The margin for error for

the whole sample is + or - 3 percentage points, and slightly larger for the subgroups. The Author would like to add the best repellent for fire ants he has ever found is baby powder with talcum. **No matter how much volatile pesticide poison "they" spray, the fire ants continually are increasing in numbers and in infested territory!**

Help is simply a phone call away. If you are bitten or stung, call your local health care provider or physician to determine if you can be treated at home, need to be seen by a physician or should go directly to a hospital emergency department. If you can be treated at home, your health care provider should keep in phone contact with you by calling back and checking on your condition. If your condition worsens, you should go to the nearest emergency department or call the paramedics or an ambulance. The following suggestions are not intended to replace proper medical care. Always treat a small area before using any product, herb, oil, shampoo, soap, cleaner or material on your body. Things you can do to prevent venomous bites or stings: (It helps if you do not look or smell like a flower or wear flashy jewelry.)

Things You Can Do To Prevent Venomous Bites Or Stings Around Your Home

Repellants - Bathing in a tub of warm water with certain bath oils, many essential oils and/or some sunscreens also can repel pests repel insects, arachnids and/or mites for hours. Thiamine (vitamin B1) taken orally or 60 milligrams of zinc taken daily also will act as a natural repellant. Single B vitamins should be accompanied by a B complex or multivitamin. Zinc should be taken with food to prevent an upset stomach. Be you're your multi vitamin/mineral has 2mg of copper for balance. **You can give your dog or cat a garlic and yeast supplement to help repel insects.**

Blood Feeding Arthropods

Get rid of rocks, mulch, litter, wood, paper, logs and debris from your yard.

Be very careful when operating vibrating equipment (lawnmowers, chain saws, weed eaters, etc.) that may disturb a fire ant, bee hive or wasp nest.

Wear plain, light-colored and long sleeved clothing, heavy work gloves, high top boots and long pants when working outside around your yard.

Carefully check all line-dried clothing prior to bringing any of it inside the house.

Keep doors and windows tight fitting with good weather stripping. Do not leave shoes, boots, drinks, clothing items and towels outdoors.

Make sure other openings (such as where air conditioners, swamp coolers or exhaust fans enter your house) are closed, sealed or fitted with a fine mesh screen and are dusted with talcum powder. Always protect your feet and wear shoes when outdoors, especially around the pool at night.

Fill all cracks in the foundation of the house and around all water faucets. Don’t aggravate stinging insects that approach you.

Look before you place your hand under or into something, especially rocks. Always check your clothing,

bed and footwear before putting them on.

Make periodic checks for bee hives or swarms; if any are found, carefully remove them...

Blood feeding arthropod pests are of great concern not only because of their annoying and often painful bites, but more importantly because many can also be vectors (carriers) of pathogenic (disease) organisms, that seriously injure or kill humans and domestic animals, e.g., encephalitis, tularemia, Lyme disease, malaria, yellow fever, Chaga's disease, bubonic plague, murine typhus, tapeworms, Rocky Mountain fever, etc. Specific identification is particularly critical in these dangerous pests because members of each group are very similar in appearance, but differ in their choice of hosts, habits and potential as disease vectors.

Every blood feeder needs a blood meal at some point to complete its life cycle. The only exception are some of the males of this group, e.g., male mosquitoes, male horse flies, etc., who don't need blood. Some blood feeders will feed on only one host species. However, most blood feeders have not only a preferred host, but also will feed on a wide range of substitute hosts. When multiple host species are involved, there is a greater possibility of disease transmission, e.g., the malarial parasite, yellow fever virus, rickettsiae of Rocky Mountain spotted fever, the bubonic plague bacillus, etc. Many wild animals can serve as reservoirs of disease organisms and still suffer only a few or no ill effects themselves, e.g., roof rats are reservoirs for human plague and typhus with fleas serving as the vectors of these diseases. Some of these blood feeders remind us we are not always on the top of every food chain.

First, properly locate and identify the blood-feeding pest(s) involved.

Second, practice exclusion and prevention. This consists of denying access into the structure of the hosts and the insects themselves. Access to any crawl spaces or attics must be denied so wild animals such as opossums, feral cats and dogs, skunks, birds, bats, commensal rodents, squirrels and raccoons cannot enter. Exclusion consists of reducing openings into the building so that wild animals and/or insects cannot gain entrance. This is done by carefully plugging or sealing holes with concrete, caulk or other appropriate materials; carefully screening windows, doors and vents; reducing door threshold gaps, installing door sweeps, cleaning and spraying Tweetmint enzyme cleaners, mopping with borax, etc.

Indoor control and sanitation. Mechanically reduce pests by vacuuming or

steam cleaning or rinse- and-vacuuming all rugs, floors and fabric-covered furniture along with routine cleaning or properly disposing of all infested pet bedding. Remove and clean up all harborage debris; vacuum or steam all insects, spiders and/or mites; remove all rodent nests; caulk all cracks and crevices; vent and cover all crawls; routinely and thoroughly clean with Safe Solutions, Inc. Tweetmint Enzyme Cleaners with Peppermint and/or borax.

Outdoor control. Begin with sanitation, e.g., debris removal; keep the grass and weeds mowed; trim all branches that touch or overhang your building; remove all old bird nests from the structure, and eliminate any alternate hosts and their harborage within 100 yards of the structure. Sanitation is followed by the application of diluted or Safe Solutions, Inc. Tweetmint ((protease) enzyme cleaners with peppermint or other Pestisafes®, e.g., talcum powder, food-grade diatomaceous earth (DE), Vaseline, freshly ground pepper, menthol rub and/or Tide® soap.

The best treatment for insect bites and stings is to avoid them in the first place. If practical, wear 2 layers of clothing, avoid floral prints, hair spray, perfumes and shiny jewelry. The color blue is the preferred color of mosquitoes; wear white, tan and/or light green clothing. Routinely shower with peppermint soap. Try orally taking 3 - 4 garlic capsules and vitamin B and nutritional yeast daily. Avoid eating sugars, alcohol, tropical fruits and juices. Thread a sprig of elder through your hair. To create a mosquito-free environment, boil willow in water, burn artemesia in a campfire or diffuse various combinations of the oils of citronella, eucalyptus, pennyroyal, grape seed, almond, lavender, rosemary, tea tree, basil, geranium and/or sage into the areas. You can also make a room spray with water and a few drops of these essential oils or with enzymes. Essential oils, e.g., geraniol or geranium oil and coconut oil, diluted in olive oil or aloe vera nectar or jojoba can be applied topically to pulse points on your body every hour or so to repel insects (e.g., fire ants, ticks, fleas, mosquitoes, lice and gnats), but can be irritating to some people, so always test them on a small area of your skin first! As the odor lessens, so does the effectiveness. Try chamomile tea, thyme, sweet basil, yarrow, vanilla extract or try dilutions of camphor, tea tree, bergamot, patchouli, sandalwood, peppermint oil, Guatemalan lemon grass, lavender, cedar wood and pennyroyal *(Mentha pulegium)* individually or as blends. Pennyroyal's Latin name means mint and flea and the plant and smoke from its burning leaves help control these pests, but avoid this and other mint plants if you are pregnant or sensitive. Other essential oils that can be made and used as repellents include menthol, citronella, eucalyptus, geranium and okra but they can stain clothing; do not drink them and be careful around your eyes and

mouth when applying them.

If bitten, leave the area immediately, and if the bite is considered serious, go to a physician immediately, but first remove the stinger and cleanse the area as soon as possible. If you are not sensitive, you can ingest homeopathic *Apis mellifica* and rub an apis-based cream or a little epsom salt water or Tweetmint protease enzyme cleaner on the wound every 15 minutes until relief arrives. You can also apply echinacea tincture to the sting area and take it internally to help reduce allergic reactions and other immunological disturbances. **Puncture a natural Vitamin E capsule and apply the oil to the area.** If the bite/sting feels better when cold is applied or the area is already cold and/or numb, use homeopathic ledum. Ice alleviates pain and swelling and mud or clay, fresh garlic, onion juice, witch hazel, baking soda or meat tenderizer paste eases itching and aching. (Baking soda is an alkali that neutralizes acid. Applied to the skin it acts to reduce pain and swelling, draws out toxins and helps neutralize some of the inflammatory agents in the toxins.) Meat tenderizer is made from papain, a protease enzyme derived from papaya and helps break down the inflammatory properties of venom. (That is why Safe Solutions Tweetmint (protease) enzyme cleaners and shampoos also work.)

Various herbs rubbed into insect bites may also accelerate healing: ground-up comfrey, sweet basil, tea tree oil (a powerful wound healer and germicide), olive oil, marigold, yellow dock, wild marjoram, leek bulbs, crushed parsley or plantain and/or the leaves of rue, St. John's wort, plantain, house leek, aloe and pennyroyal. Apply calendula petals on a bee sting. Wasp stings are best treated with any wild mallow flower or freshly chewed or crushed plantain leaves, slices of onion or garlic or vinegar applied topically, accompanied by an internal dose of homeopathic vespa. Taking vitamin C and panthothenic acid over a period of 3 - 4 hours helps create a natural antihistamine effect, thus reducing swelling. The enzymes bromelain and quercitin (individually and in combination) also help reduce inflammation. If you are upset try taking a calming flower remedy under the tongue every 10 minutes until you settle down. If you are allergic to bee stings, get medical attention immediately. Your own urine on a clean cloth has antibodies that can neutralize an insect's venom. Apply pulped or crushed leaves of wormwood, rue or sage to alleviate the pain of scorpions, spiders or jellyfish, **but some people may be sensitive, especially to wormwood or rue.** Increase your intake of vitamin C and you receive anti-inflammatory effects and boost your liver's ability to filter out the toxins. Take chlorophyll supplements to boost your immune system and help detoxify your blood. Take shiitake or reishi mushroom

supplements to help you detoxify. Try spraying a mix of 1000 mg. of vitamin C in a cup of warm water (a 1% - 3% solution) or diluted or Safe Solutions, Inc. Tweetmint Enzyme Cleaner from a small "spritzer" bottle on the bite/sting as a sting reliever. **The Author uses hydrated/moistened Terramin Clay to immediately remove most pains caused by stings or bites. Seek medical attention!**

Bend your arm and note where it forms a crease at your elbow. Put your thumb at the point at the end of the crease, away from the body and press slowly into the joint. This acupressure point helps alleviate the redness and swelling of bites and stings. Remember, the emotional reaction to a sting or bite is often more severe than the actual hazard from the venom.

How to help detox your body - Like the ocean, tears are made of salt water. Protectively they lubricate your eyes, remove irritants, reduce stress hormones, and they contain antibodies that fight pathogenic microbes. **Tears are your body's release valve for stress, sadness, grief, anxiety, and frustration**. Also, you can have tears of joy, say when a child is born or tears of relief when a difficulty has passed. Tears are part of your body's detoxing excretions, just like your sweat and mucous and urine. Sweat removes toxins and excess salts from your body and cools you; mucous traps surrounding pathogens; urine and feces also expel unneeded, toxic waste products that would harm your body if they remained within it. Chemicals found in emotional tears include the protein prolactin, the Adrenocorticotopic hormones and the endorphin leucine-enkephalin. Prolactin is known to control breast milk production. Adrenocorticotropic hormones indicate high stress levels. And, leucine-enkephalin, which is an endorphin that reduces pain and helps to improve mood. **In Psalm 56:8 we read: "You have kept count of my tossings; put my tears in your bottle. Are they not in your book?"**

Scientists distinguish three kinds of tears, basal tears keep your eyes lubricated, important in preventing damage by air currents and bits of floating debris. Basal tears, like all tears, have numerous components. A little bit of mucus allows them to adhere to the eye surface without causing harm. Tears, which are spread evenly over the front surface of your eye during blinking, clean and lubricate your eyes. An important component of tears is lysozyme, a chemical that inhibits bacterial growth on the surface of your eyes. Some of the tears evaporate, but the remainder are drained into your nose through your tear ducts, keeping your nose moist. Lysozyme from the tears prevents bacterial growth in your nose as well. **Irritant tears** are formed when your eyes are hit by wind or sand (or insects or dust). Irritant, or reflex, tears have the same

constituents as basal tears, and work toward the same goal: protecting your eyes. However, since they are designed to break down and eliminate eyeball-intruders like airborne dust, these tears tend to flow in greater amounts and probably contain a greater concentration of antibodies and enzymes that target micro-organisms. Thus, irritant tears are not just basal tears in greater quantity; different biological processes precede the excretion of the two types of tears. **Emotional tears** are secreted in moments of intense feeling – sometimes joy, but more often sorrow – these tears aren't there to cleanse your eyes of irritating microbes or debris they are there to help cleanse your soul! Emotional tears contain much more more of the protein-based hormones prolactin, adrenocorticotropic hormone, and leucine enkephalin (a natural painkiller), all of which are produced by our body when under stress than basal or irritant tears. The proteins found in emotional tears are hormones that build up to very high levels when your body withstands emotional stress. If the chemicals associated with stress did not discharge at all, they would build up to toxic levels that could weaken your body's immune system and other biological processes. But here, as in other areas, your body has its own mechanisms of coping. You secrete stress chemicals when you sweat and when you cry. **It is physically very healthy to cry -women often do and they live longer - most men do not and they die earlier! T**hough humans are the only creatures known to shed emotional tears, though it’s possible that that elephants and gorillas do too. Other mammals and also salt-water crocodiles produce reflex tears which are protective and lubricating. **It is interesting to note that sea animals, including birds, rely most heavily on tears for removing toxic salts from their bodies**.

The mantra to children 'Be brave, don't cry' might not be wise because crying can actually help reduce pain. Emotional or stress-related tears are thought to help you through difficult times in a number of ways. Physically, they are thought to wash toxic chemicals out of your body, while psychologically giving your feelings a good airing is thought to be a healthy tonic. Crying is thought to help reduce stress, which can have a damaging effect on our health and has been linked to a number of health problems including heart disease, high blood pressure, type-2 diabetes and obesity. Dr. William Frey at the Ramsey Medical Center in Minneapolis discovered that reflex tears are 98% water, whereas emotional tears also contain stress hormones which get excreted from the body through crying. After studying the composition of tears, Dr. Frey found that emotional tears shed these hormones and other toxins which accumulate during stress. Additional studies also suggest that crying stimulates the production of endorphins, our body’s natural pain killer and "feel-good"

hormones." According to a Minnesota study, crying can help to wash chemicals linked to stress out of your body, one of the reasons you feel much better after a good cry. Higher levels of adrenocorticotrophic (ACTH) have been found in emotional tears (compared to reflex tears). Removing this chemical from your body is beneficial because it triggers cortisol, the stress hormone – too much of which can lead to health problems associated with stress. In addition to physical detoxification, emotional tears heal the heart, lift your mood and help you to deal with painful situations. Deep crying exposes and expresses deep emotions, which means they can then be dealt with. 'The Freudian theory is that it's beneficial to get your feelings out, that if you let them fester they can affect you physically and psychologically, so go have a good cry! **Let your tears flow to purify away toxins, stress and negativity!**

The Bible (Strong's Concordance) provides 697 references for verses associated with crying (weep, cry, tears). One of the first Bible references for tears is in the book of Genesis when Abraham wept over the death of Sarah. Hannah wept before the Lord in her barren state. Esau wept over his father Isaac, asking for a blessing. King David writes prolifically in the Psalms of his tears before the Lord, even saying they were his portion day and night. The Bible provides accounts of tears of grief (as above, also David weeping over the death of Absolom, Jairus's daughter and the death of Jesus Christ). Others wept tears of repentance and sin-sorrow (Israel as they stood to hear the scriptures read and were broken over not following the Lord their G-d and His law, David as Nathan confronts him, Ninevah when Jonah finally goes there to pronounce G-d's judgment,). Jeremiah was called the Weeping Prophet, authoring the book of Jeremiah and the Lamentations of Jeremiah. Jeremiah wept for the pride of Judah. Israel cried to G-d in affliction. G-d is called "Comforter" (Jeremiah, for example) and the G-d of all comfort. G-d's law and His love are described as comfort-givers. Crying has been found to lower stress, blood pressure and pulse rate. **Tears actually remove toxins from your body. The simple act of crying also reduces your body’s manganese level, a mineral which affects your mood and is found in up to 30 times greater concentration in tears than in blood serum**.

SAFE AND FAR MORE EFFECTIVE ALTERNATIVE PEST CONTROLS.

ANTS

Ants are the most dominant group of social insects. **The combined weight of all the world's ants is about equal to the weight of all the humans!** In the savanna of the African Ivory Coast the density of ants is more than 7,000 colonies and 20 million individuals per hectare. Ants belong to the insect Order Hymenoptera and are close relatives of bees and wasps. Throughout the world there are over 20,000 species of ants, but only about 50 are known to be pests of our food or structures. Except for the polar regions and a couple of islands, ants flourish on all land areas of the earth, from rain forests to deserts. Ants are commonly found foraging or nesting inside our homes and buildings - and swarming ant reproductives are often confused with swarming termites. Only a comparatively small proportion of ant species can cause damage - only these few ants are considered to be pests around our homes and buildings because they feed on and contaminate our food stuffs, damage our wood structures, build unsightly mounds in our lawns and even fewer ants are aggressive and are able to inflict painful bites or stings. **Most ants are extremely beneficial cleaning up mess after mess and up to 95% of all weed seeds! (They truly are nature's little garbage collecting ladies.)**

Foraging - Ants are omnivores and eat a wide variety of food, including other insects, seeds, nectar, meats, greases, sugars and honeydew. Honeydew is a liquid produced by plant-sucking insects, such as aphids, plant mealy bugs (groups of small insects with a white powder clinging to them), scale insects, and plant hoppers. These insects feed in groups on plant stems and leaves. Many species of ants protect these aggregations from other insects. Ants take drops of honeydew continuously produced by the small sap-sucking individuals. Some ant species appear to just wander randomly; others trail each other precisely from colony to food and/or water source and back. Most ants follow structural guidelines as they travel, rather than in a straight "beeline". Ants communicate with each other using different methods, including pheromones, touch and stridulaton (sound production), for transmitting messages. Workers foraging for food attract attention and communicate their messages when they return to the colony. Honey seems to really attract honeydew-eating ants. Add 5% or less boric acid or sodium borate or food-grade DE or aspartame to make an excellent

sweet bait which has both a food attractant and a convenient moisture source. Although ants are annoying when they come indoors, these little garbage collecting ladies can be beneficial by feeding on weed seeds, fleas, termites, and other pests in your yard or garden. Killing the visible sterile ants in your home may make you "feel better" but it will never solve your ant infestation. Killing ants inside your home will not prevent more ants from entering your home until you kill all of the queen ants! **Combine several Intelligent Pest Management ® methods such as caulking entryways, cleaning up food sources, removing the conditions conducive to the infestation and baiting.**

ANT CONTROL AND MANAGEMENT - The best control for ants is cleanliness. Sponge up invading ants with soapy water as soon as they enter. Store food attractive to ants in closed containers. Clean up grease and spills. Ant-proof kitchen garbage pails with sticky barriers such as petroleum jelly under the lip and place pet dishes in a moat of water. Remove or manage sweet food sources next to your house such as aphid-infested bushes and ripened fruit on trees. Keep plants, grass, and organic mulch at least a foot away from the foundation of your buildings to reduce ant foraging and nesting. Control all obvious moisture problems. **The ant's greatest enemies are other ants**. It is important to note that all of the ants found indoors, only a few species are responsible for the majority of infestations; some species are not common inside a structure but appear sporadically; and other types of ants are found inside only under rare or accidental conditions. **Remember, most ant infestations originate outside the building.**

Ant Repellants - If ants are coming in through the cracks of doors and windows, put a line of chalk, petroleum jelly, Safe Solutions food-grade diatomaceous earth (DE) or cream of tartar where they enter the house, and they will normally not cross over it. A cinnamon stick, coffee grinds, chili pepper, paprika, cloves, or dried peppermint leaves near the openings will also repel many ants. You can also squeeze the juice of a lemon at the entry spot and leave the peel there. Planting mint around the foundation of the house will also keep most ants away..

Place cinnamon sticks or garlic in areas where you have seen ants enter, such as in window tracks, by doors and in corners around your home. While garlic cloves are not as aromatically pleasing as cinnamon sticks, they work really well. Just peel and slice a few cloves and place them where you notice the ants. Or you can use fresh cloves and most of the ants will often simply pack up and leave. Pour some white vinegar or apple cider vinegar in a spray bottle and spray on areas where you have seen ants. The fungicidal and insecticidal properties in the vinegar help repel ants. Sprinkle black pepper where you see

ants. The ants will immediately scatter. Pay attention to where they run; chances are they will be exiting your house and you will be able to treat the entry area with pepper too. For serious anthill problems in your yard or walkway, pour boiling water over the anthills. Mint destroys the smelling capabilities of ants and prevents them from entering your home.

There are several ways to use mint to prevent ant infestations. First, plant mint around your home, especially near doors and close to areas where you have seen anthills. Second, place mint leaves in and around windows. If ants are entering your pantry, place some mint leaves on the shelves and in the corners. Third, simply routinely clean with Safe Solutions Enzyme Cleaner with Peppermint. Here are some plants which are effective ant repellants - usually the stronger the smell, the more likely the plant is to keep the ants away: Basil, Chili peppers, Eucalyptus, Garlic, Lavender, Peppermint, Rosemary and/or Thyme. Persistence is the key when trying natural ant control remedies. If one method does not work for you, then try another. You may need to repeat it a few times.

The Author has found several schools that had been sprayed with various volatile, synthetic pesticide poisons once a week for 15 years or more without every getting "ant control". Ants are the most common cause of callbacks for the pest control industry, so why use their volatile poisons?

Inspection - **The key to virtually any ant control is to find the nest.** All ants are social insects that live cooperatively in a colony. Large numbers of worker ants can be killed without ever solving your pest infestation. Keep a daily log or record of where ants are seen. Bait the workers with jelly, peanut butter, cut-up crickets, oils, proteins, apple sauce etc., and follow them back to their nests, or inspect with a yellow or red light at night.

Habitat Alteration

Sprinkling food-grade diatomaceous earth, Comet® or Tide® laundry powder/soap or planting mint and lavender or lightly spraying Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint around the building or dog runs are a delightful deterrents/repellants.

Caulk all wall penetrations and mortar masonry cracks. Wall penetrations include utility lines, air conditioning, refrigerant pipes, phone lines, etc.

Tighten all door and window frames. Sprinkle food-grade DE, talcum powder, baking soda, Comet® and/ or medicated body powders where the ants are entering.

Repair water leaks. (Remember, carpenter ants love to nest in insulation,

especially if it is damp.)

Trim all shrubbery and branches away from house. Remove mulch.

Remove any firewood that is stacked close to buildings; boards, stones, etc. that encourage nesting; screen openings in hollow pillars, columns, and ventilators.

Leave a small, low wattage night light on for a few nights in the area of most ant activity. The change in light can disrupt and discourage their foraging patterns.

Control ant-tended aphids, scale and mealy bugs with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint diluted 4 oz. per gallon. This will remove ants and their scent trails.

Intelligent Pest Management®

Conduct a thorough inspection. Spray and/or mop with borax. (Use ½ cup of borax per gallon of hot water. Remember to keep borax away from plants and any surfaces/areas that food, children or pets touch.)

Consider the species when choosing bait. Some excellent ant bait choices include Light Karo Syrup, cornstarch, honey, molasses, peanut butter and/or jelly. Use baits with non-volatile stomach poisons, e.g., aspartame. Food-grade DE, boric acid, borax or sodium borate. Baits are excellent in critical areas, e.g., computer or hospital rooms. Mix (5% or less) food-grade DE, boric acid (or borax) into any food you see the ants eating - if the ants die by the poisoned bait - use less aspartame, DE, boric acid or borax - **be careful not to allow children, pets or wildlife to eat these toxic baits.** Remember to routinely switch from carbohydrate back to protein baits, or use both. Do not spray or dust around baits. Never store baits or bait materials where they can be contaminated with any other odors, especially smoke or fumes of volatile pesticide POISONS. Ants and other insects can detect minute amounts of foreign or repellent chemicals and will avoid chalk lines, calcium chloride, baking soda, food-grade DE, Comet®, talcum powder and other fine dusts.

Fire Ant Repellent: Lightly sprinkle baby powder with talc or food-grade DE on your shoes, socks, cuffs and legs to protect yourself.

INTELLIGENT ALTERNATIVE CONTROLS FOR ANT CONTROL

Be sure to trim all branches that touch or overhang the building and caulk all visible cracks, crevices and other openings. Make ant barriers with chalk, petroleum jelly, Comet®, talcum powder, food-grade DE or medicated powder. Maintain routine and thorough sanitation. **Caulk all openings to the exterior and install door sweeps.**

Routinely clean with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per gallon) and/or borax (½ cup per gallon of hot water), empty garbage and vacuum daily. Carefully caulk/seal all cracks and crevices where a nest is suspected. Properly store food and garbage. Vacuum up all visible ants.

Lightly sprinkle Safe Solutions food-grade DE, talcum powder, baking soda, Tide® soap or freshly ground pepper or calcium chloride (Comet®) outside and lightly dust with talcum or Comet® or calcium chloride dust or baking soda or medicated body powder or food-grade DE inside along the edges and in all remaining cracks, crevices and sill-boxes. Keep food and garbage properly stored away from ants. Improve drainage. Trim all branches that touch or overhang the building. Put bands of Tanglefoot ® or STP® oil treatment or petroleum jelly around the perimeter of infested trees.

Mix 45% baking soda and 45% powdered sugar and 10% dry active yeast or powdered vitamin C and place the bait mix wherever you see ants. Mix 5% - 10% food-grade DE in honey or (fermenting type) molasses. The only way to eliminate ants permanently is to destroy all of the queen(s).

Spray ant trails with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint or Lemon Joy® or vinegar or perfume or sprinkle talc or food-grade DE or freshly ground pepper or calcium chloride (Comet®) or baking soda, or draw a line of chalk or petroleum jelly where you do not want them to cross. Properly install and maintain dehumidifiers. Eliminate moisture problems and improve ventilation.

Spray all visible ants with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per quart of water) or vacuum them up.

Spray nests with white vinegar, Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint or Fantastic®, or sprinkle them with talcum (baby) powder, calcium chloride dust, medicated body powder, food-grade DE, Comet® or crushed chalk. Fumigate with carbon dioxide or steam them. **Finding and then**

eliminating the nest is the most effective ant control technique.

Make your own fresh borax or boric acid baits using their preferred foods, e.g., a liquid bait can be made with ½ teaspoon (or less) of boric acid in 2½ fluid oz. of honey or corn syrup or molasses - heat and stir until the boric acid or borax is dissolved completely - mix in at least 1 - 2 equal parts of water (dilute the bait more if you see dead ants by the bait) then put in small vials or lids or small tin foil "cups" where you have seen ant activity - **but safely out of the reach of children, pets and wildlife**. Bait until control is achieved (usually borax or boric acid baits should have 5% or less boric acid or borax).

Ants in your pet's food? Draw a line of white chalk or petroleum jelly around the dish.

Mop the floors with ½ - 1 cup of borax or baking soda per gallon of hot water. **Keep crawling children off the borax cleaned floor! It would be better to mop the floors with the Safe Solutions Tweetmint Enzyme Cleaner with Peppermint at a rate of 1 oz. per gallon.**

Flood or drench all outside nests with 3 gallons of warm water and 4 oz. of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint or carbon dioxide or carbon monoxide or diluted orange juice or steam. Be sure landscape mulch is 2" or less. Remove all debris.

Ants in voids or hollow trees - Dust with talcum powder or food-grade DE and then fill the cavity with aerosol foam insulation. Put bands of Tanglefoot ® or STP® oil treatment or petroleum jelly around the perimeter of infested trees. **Eliminate all moisture problems.**

Flood or drench all outside ant nests, e.g., fire ants, with

1 gallon of orange juice plus 2 gallons of water plus 2 tablespoons of dish soap.

Several 2-liter bottles of Coca-Cola.

3 gallons of warm water and 1 - 2 oz. of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint per gallon.

Alternative Sprays and/or Powders

Mix 10% salt and some white pepper or Tabasco® sauce in water and spray to repel ants.

Blend one clove of garlic, one onion, one tablespoon of cayenne pepper and a quart of water. Steep mixture for one hour, strain, add a tablespoon of liquid soap and spray it for ant control.

Wash kitchen surfaces with vinegar or baking soda solution. Sprinkle baking

soda, calcium chloride, bone meal, chili powder, talcum powder, Tide® soap, and/or powdered charcoal in and around suspected points of entry.

Pour a line of any of the following where ants are entering the building: baking soda, calcium chloride or Comet®, cinnamon, talcum or chili powder, bone meal, medicated body powder, food-grade DE, cream of tartar, red chili pepper, salt, Tide® soap, dried mint or sage, cucumber peelings, or simply draw a line of chalk.

Mix of 10½ oz. of water, 3 oz. of hot sauce, 1 oz. of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint. Spray where ants enter the home or building.

Spray them with virtually any cleaner you have. Create a barrier with petroleum jelly or STP® oil treatment.

Leaving a large piece of peanut brittle in the sun can trap literally thousands of small sweet-eating ants on the sticky surface per Howard Rustin.

Other Alternative Baits

Combine: 1 part active yeast, 2 parts molasses and 1 part sugar. Mix the ingredients well. Drop a teaspoonful on several small squares of white paper. Place the paper squares along ant trails where they will not be disturbed. How does it work? The ants are attracted to the sugary feast and consume it readily. The action of the yeast, however, produces gas in their bellies and they can not rid themselves of it. They essentially pop. The best part of this method of alternative pest control is that it utilizes no volatile poisons which could harm you or your family or your pets.

Mix ½ cup molasses and ½ cup peanut butter and 1 packet of active dry yeast.

Sprinkle aspartame around the ground (fire ant) nest and lightly mist the powder with water. Reapply as needed.

Mix aspartame in fruit juice or peanut butter or bacon fat and place wherever you see ants.

APHIDS

Aphids, or plant lice, can affect virtually every plant. Almost every plant has one or more aphid species that occasionally feed on it, but low to moderate numbers of aphids usually aren't damaging to indoor plants, gardens or landscape trees. Although aphids can curl leaves and produce sticky honeydew, they rarely kill plants and you usually can simply wash them off with plain water. When aphid numbers get high, natural enemies frequently arrive to feed on them, eliminating the need for pesticide POISONS. When control is necessary, use a solution of (1 oz. per 2 quarts) Safe Solutions Tweetmint Enzyme Cleaner and water and make sure you make all of the aphids wet. Aphids are common in your garden because: aphids like lush new growth. Do not over fertilize. Use organic or slow-release products. Plant chives, marigolds, mint, basil, or cilantro or place aluminum foil at the base of your plants. The foil reflects light onto the undersides of the leaves, which scares away aphids.

Aphid populations quickly build up on flowering plums, roses, tulip trees, crape myrtles, apples, and many vegetables. **Expect aphids when you grow these plants**. Ants protect aphids from beneficial insects. **Aphids and Ants go together, so keep ants off plants to help natural enemies do their job of eating the aphids**. Prune out infested leaves and stems. Knock aphid populations off plants by shaking the plant or spraying it with a strong stream of water. Protect seedlings with covers or aluminum foil mulches. Wait for hot weather; most aphids are heat-intolerant and will be gone by mid-June. Use a hair dryer on inside plants Introduce some of the aphids' natural enemies: Lady beetles, both adults and larvae; Lacewings; Syrphid fly larvae; Soldier beetles; and Parasitic mini-wasps that turn aphids into crusty, little mummies. Beneficial insects such as lady beetles and lacewings will come into your garden naturally when aphids are abundant. Protect these good bugs by avoiding the use of insecticide POISONS that can be toxic to a broad variety of beneficial insects. Blast aphids off of the plants with a strong spray of water.

Nothing is more eco-friendly than water! As aphids are attracted to the color yellow, a bright yellow pan one-quarter full with water will draw aphids, who will then land on the water mistaking it for a plant, sink, and drown. Adding a shiny product to your mulch helps to "foil" aphids and encourages plant growth as well. You can choose from many different types: clear plastic mulch spray painted silver, reflective plastic mulch, aluminum coated construction paper, or squares of aluminum foil. Adding shiny material to

the base of the plants reflects light on the undersides of leaves, deterring aphids and giving the plants more light. Companion plants can reduce many problematic pests. Some, like garlic or stinging nettle, repel these pests altogether, while some, like nasturtium, attract existing aphids away from your vegetables onto themselves. Aphids prefer yellow flowers, and trailing nasturtium works especially well when trained to grow around tree trunks, protecting your orchard or landscaping from aphids.

Companion planting is an eco-friendly way to solve many pest problems; for aphids, plant spicy and repellent crops such as chives, cilantro, garlic, onions, or radishes in between or in alternating rows with your other plants. Safe Solutions Food-grade Diatomaceous earth (DE) appears as a fine talcum powder, and is made of miniscule fossilized water plants. DE is lethal to aphids and many other types of common pests, including fleas, ticks, flies, cockroaches, ants, mites, and earwigs. A regular light (if you see white it is not right) dusting with natural food-grade DE (not crystalline DE available at pool supply stores, which can be dangerous to humans and pets) with keep your garden, backyard, and even living room pleasantly insect-free. The fungus *Beauveria bassiana* attaches to the outside of the pest, then penetrates into the body, killing aphids, mites, weevils, and whiteflies.

If controls seem necessary, use the safest nonchemical pest control methods first to manage aphid populations. However, if you feel additional controls are necessary, choose less toxic products. Tweetmint Enzyme Cleaners are the most effective and safest products. When properly used, these materials solve most pest problems. Oils and soaps work by smothering aphids, so apply these products thoroughly. Don’t apply them to drought-stressed plants or when it is very hot. A few plants are sensitive to these products. Apply diluted Tweetmint enzyme cleaners, insecticidal soaps, soap-pyrethrum mixtures, or neem oils on vegetables or small bushes such as roses. Narrow range oils, such as parafinic, supreme, or superior oils, are appropriate for larger trees. **Oils and soaps will not kill aphids hidden within/under curled leaves. It is best to prune these out**.. **One of the simplest and most effective controls is a solution of (1 oz. per 2 quarts) Safe Solutions Tweetmint Enzyme Cleaner and water.**

BACTERIA/GERMS

Bacteria and germs are easy to control simply by washing with soap and water - remember when Mother told you to wash your hands? Sunlight and/or Ultraviolet lights will also disinfect and kill bad bacteria - the sun is an enormous ball of mostly helium and hydrogen gases. Inside this swirling mass of gases is a gravitational force so powerful that it squashes the hydrogen atoms together to form helium and energy. The energy produced in this nuclear furnace consists of both heat and different forms of light, such as visible light, infrared and ultra violet light, known as UVs. The ultraviolet radiation produced by the sun is quite strong. It can break apart molecular structure and change the way color is reflected back. This photochemical change is what causes stains to disappear on soiled laundry and brighten whites. Left in the sun for several hours, the ultra violet radiation will also kill the bacteria on textiles and other household goods. This bacteria fighting quality makes sun bleaching a perfect way to disinfect & freshen old rugs, seat cushions, sleeping bags, and draperies. It even works on non-textile items such as foam, plastics, garbage cans and it can be used to safely bleach yellow and dingy book pages. Small doses of sunlight on your household goods is a natural way to clean, whiten, and disinfect. It's also an excellent solution for disinfecting and freshening up those items that can't be washed. Too much exposure to the sun can cause a whole range of problems. Left out in the sun too long, the visible light spectrum and the heat generated by the sunlight's infrared component can ruin fabric permanently.

You can kill bedbugs, dust mites, and even all bacteria by simply enclosing your mattress in a large plastic bag (you can get this from a moving company or mattress dealer) and filling the bag with carbon dioxide, or nitrogen - both are available at a welding supply house or you can use dry ice. (The Author has also used carbon dioxide which is heavier than air to disinfect grain and other items in a plastic barrel or clean garbage can.) The atmosphere inside the plastic bag will soon be totally devoid of oxygen, thereby killing all living things. The amount of inert gas in the bag is not enough to hurt you, who are outside the bag. Just have the door or windows open when you open it. Let the bag sit for a couple of hours before opening. Remember, this is not POISON gas, but simply air devoid of any life-giving oxygen, so ventilate the room you are in, or do this control outside. The main problem is that all the sweat, skin particles, and general debris that has filtered into your old mattress is still there, ready to breed up a new generation of bacteria.

You can also disinfect most items using either steam or Safe Solutions Tweetmint Enzyme Cleaner with Peppermint. One of the best ways to safely and effectively disinfect is to use household hydrogen peroxide and vinegar - The direct combination of the two substances, hydrogen peroxide and vinegar, produces a strong oxidizing agent known as peracetic acid (also known as peroxyacetic acid, or PAA). The reaction occurs when hydrogen peroxide reacts with the active component in vinegar, acetic acid. Peracetic acid is a much weaker acid than the reactant, acetic acid; however, it has different properties and characteristics. Due to its high oxidizing potential, peracetic acid is often used as a sanitizing product. It is effective against a large range of bacteria and, in food, breaks down to acetic acid and hydrogen peroxide, which are considered to be safe and environmentally friendly. This gives the substance application in sanitation of hard surfaces on which food is prepared, wineries and breweries, greenhouse facilities and even directly onto foods such as vegetables, fruits and meat. The substance at high concentrations can be highly corrosive and cause irritation to the skin, eyes and respiratory system. Long-term exposures to the substance can cause permanent lung damage. The best way for using the two products as a sanitization product, is to keep white or apple cider vinegar in one clean sprayer and 3% hydrogen peroxide in another. These used simultaneously killed virtually all *salmonella, shigella* and *e.coli* bacteria on all contaminated surfaces and food as shown in the tests run at the Virginia Polytechnic and State University. **This proved the combination of the two mists separately to be more effective at killing bacteria than chlorine bleach or other commercial kitchen cleaners. The tests also proved that their simultaneous use is ten times more effective than either using one of the products only and was generally even more effective than using the two as a mixture**.

BARK BEETLES

Bark beetles are common pests of many trees. Some of the most damaging attacks occur to pine trees and other conifers. Trees already stressed by drought, disease, or mechanical damage are most likely to suffer. **Insecticide POISON sprays can't save infested trees. Removal of infested trees is the surest way to get rid of bark beetles and southern pine beetles and then protect healthy ones with proper nutrition and cultural care**. Adult bark beetles are small, dark, cylindrical insects about the size of a grain of rice; they can fly from tree to tree. Larvae are tiny grubs that feed beneath bark on branches and trunks. Infested trunks and branches have many tiny holes where beetles have bored in or emerged. Tree sap or dust from boring can exude from these holes.

If you peel back bark on infested trees, you'll see galleries, or tunnels, from adult and/or larval mining. Bark beetles injure trees by disrupting the flow of nutrients. Adults and larvae feed in the area of the inner bark that transports food through the tree. Needles turn yellow and drop off infested trees. Infested trees can die in one season, causing limb drop and fire hazards. Keep trees healthy and vigorous to reduce attacks. Healthy trees defend themselves by releasing sap into holes before adult beetles can lay eggs. Drought, disease, and injuries reduce a tree's ability to combat bark beetle invasions. When possible, properly irrigate drought-stressed trees. Thin groups of trees or stands to keep remaining trees vigorous. Dense stands favor beetle attack. Avoid compacting soil and injuring roots and trunks during activities such as construction. Diversify your landscape. Avoid single-species stands. Remove severely infested trees. Regularly inspect your trees for signs of bark beetle invasions including dust from boring, small holes exuding sap, and tree decline. **Promptly remove infested trees and destroy infested material by burning, chipping or solarizing to prevent emerging beetles from attacking your healthy trees**.

You can still use the wood from bark beetle-killed trees. The wood (xylem) is largely undamaged in the first year. Although bark beetles carry blue-stain fungi, these fungi do not breakdown wood, they invade the cells but cause no change in wood structure. Although bark beetles can carry other fungi that do cause decay, these fungi typically just decay the outer sapwood of the tree. The majority of wood decay organisms come in following tree death no matter how a tree died, and are typically wind dispersed. Significant breakdown in wood structure takes more than a year. Some homeowners utilize the material as firewood. However,

if you choose to keep any material on-site, you should strip off the bark or cover the material with plastic. Covering piles of infested material with thick (10 mil) clear plastic is often recommended to prevent beetles from migrating to adjacent trees. If the decision is made to solarize infested wood, it should be: (1) stacked in direct sunlight, (2) covered with heavy (at least 4 mils thick), clear plastic sheeting, (3) loosely wrapped to minimize a beetle's ability to chew through the plastic, (4) sealed at the base by digging a trench and burying the edges, and (5) piled material should be no larger than 4 x 4 x 4 feet (1/2 cord). When done correctly, this arrangement creates a greenhouse effect, raising the temperature under the plastic up to 160oF. After three weeks of sunny weather, any remaining beetles should be dead.

Bark beetles have an array of natural enemies. Woodpeckers and other birds may eat some bark beetles. Some insects are known to control bark beetle populations under endemic (non-outbreak) population conditions. Predaceous beetles such as the blackbellied clerid (***Enoclerus lecontei***) and a trogositid beetle (***Temnochila chlorodia***), a predaceous fly (***Medetera aldrichii***), and parasitic wasps are natural enemies of the western pine beetle but rarely control it. These insects are known to have some effect on bark beetle populations, but most experts feel that parasites and predators of bark beetles are a minor factor in controlling bark beetles under the current pandemic outbreak. Northern Arizona University is initiating a study to try to understand the relationship between predators (primarily birds) and bark beetles. Un-infected trees can be protected using three methods: 1) deep infrequent irrigation; 2) properly timed applications of preventative sprays; and 3) thinning of the stand.

Protect healthy trees through good cultural care. **Insecticide POISONS are not recommended because Chemical POISONS can’t save infested trees. Insecticide POISONS, including systemics, will not be able to control the pest insects already inside the tree.**

BATS

Bats have a reputation for being spooky or even dangerous, but they are the most misunderstood and needlessly feared of the world's creatures. Out of the more than 1,100 different species of bats worldwide, there are only three species of vampire bats and none of them live in the United States. Vampire bats only live in tropical climates and typically feed on cattle, poultry or other livestock. Most North American bats have small teeth for eating insects and do not gnaw through wood or other building materials like rodents. Bats are insectivores and they normally need to eat and drink every night. Their food requirements are well served by open grasslands and parks, where insects are abundant. They feed on a huge variety of night flying insects, including mosquitoes. A single little brown bat can eat 3,000 mosquito-sized insects per night. Bats are essential to maintaining healthy ecosystems and economies, yet their populations are declining worldwide due to loss of roost trees, disturbance of dens, pesticide POISONS and outright persecution by man.

Look for bat droppings (guano) on or below their entrance. Bat droppings have tiny bits of insect shells, so they're sparkly in the sunshine and crumbly in texture, unlike mice droppings which consist mostly of plant matter. They make an amazing fertilizer. Try to avoid inhaling the bat droppings. You can get histoplasmosis (flu-like symptoms). The very young, very old, and those with weakened immune systems are especially vulnerable.

Enjoy your bananas, mangos and guavas – and thank the bats that help to bring these fruits to your table. Some bats are primary pollinators for fruits and other produce and help to disperse seeds of plants vital for natural restoration of forests. During the day they prefer to roost in tight crevices such as cracks in rocks, under exfoliating tree bark and in awnings of buildings. These locations provide protection from predators and stable temperatures. They also prefer roosting near open bodies of water. Bats can enter buildings, especially near parks, through openings as small as one-half inch in diameter. Bats may roost in attics, soffits, louvers, chimneys and porches; under siding, eaves, roof tiles or shingles; and behind shutters. In stadiums and parking garages, bats sometimes roost in expansion joints between concrete beams. Bats are rarely aggressive, even when they're being chased, but they may bite in self-defense if handled. As with any wild animal, bats should never be touched with bare hands. A solitary bat – often a lost youngster – will occasionally fly into a building through an open door or window. When this happens, the bat's primary goal is to

escape safely back outside. If bats inhabit your home or an undesirable location, it is important to use proper eviction methods to remove them. **It is illegal for anyone, including animal control officers and exterminators, to kill bats. Terminal traps and poisonous bait traps should never be used. If evicting bats from a building, it is important that all evictions or exclusions should take place prior to mid-May or after mid-September.**

The CDC notes that several highly fatal diseases have been linked to bats. Rabies is perhaps the most well known disease associated with bats. Along with animals such as dogs, foxes, raccoons, and skunks, bats are one of the primary animals that transmit rabies. An exposure to rabies most commonly occurs when a person is bitten by a rabid animal. It can also be transmitted when the saliva from a rabid animal comes in contact with a person's mouth, eyes, nose, or a fresh wound. When a person is exposed to rabies, timely administration of a vaccine known as post-exposure prophylaxis (PEP) can prevent infection/death. Once a person becomes infected and symptoms begin to occur, rabies is almost always fatal. Each year in the United States, up to 30,000 persons receive PEP due to potential exposure to a rabid animal, including bats. Histoplasmosis is another disease associated with bats. Its symptoms vary greatly, but the disease primarily affects the lungs. Occasionally, other organs are affected. When this happens it can be fatal if untreated. In addition, Histoplasmosis is caused by a fungus that grows in soil and material contaminated with droppings from animals, including bats. Droppings, also known as bat guano, can contaminate the soil and cause infectious spores to be released when the soil is disturbed. While most infected persons have no apparent ill effects, antifungal medications are used to treat many forms of the disease.

While there have been instances of humans exposed to rabid bats , most bats in a natural setting are not rabid and, in many outdoor situations, the presence or sighting of bats is common and normal. However, precautions can be taken at outdoor locales to help minimize the risk of exposure to bats and their excretions: When possible, prevent bats from entering outdoor living quarters and other occupied spaces. Consider bat-proofing your living space. Screens or mosquito netting can provide a useful barrier against direct bat contact. Teach children to never to handle live or dead bats, as well as any unfamiliar wild or domestic animals (even if they appear friendly). Tell them to report any contact or unusual animal behavior to an adult right away. In some settings, materials contaminated with bat droppings may have to be disposed of or decontaminated. In these situations, local and state authorities can provide

more information on the requirements for the removal, transportation, and disposal of contaminated material. Clean-up of areas contaminated with bat droppings should not be attempted by non-trained personnel, and proper personal protective equipment (PPE), including respirator, mask, gown, and gloves, should be worn by anyone handling the potentially infectious material.

Some bats live in buildings, and may continue to do so with little risk to inhabitants if they are unable to access living areas and the potential for contact with people is low. However, bats should always be prevented from entering rooms of your home. As noted above, "bat proofing" your home or living quarters can prevent bats from using a home for a roosting site. For best results, contact an animal control or wildlife conservation agency and ask for assistance. If you choose to do the "bat-proofing" yourself, here are some suggestions: Carefully examine your home for holes that might allow bats entry into your living quarters. Any openings larger than a quarter-inch by a half-inch should be caulked. Use window screens, chimney caps, and draft-guards beneath doors to attics. Fill electrical and plumbing holes with stainless steel wool or caulking. Ensure that all doors to the outside close tightly. Most bats leave in the fall or winter to hibernate, so these are the best times to "bat-proof" your home. During summer, many young bats are unable to fly. If you exclude adult bats during this time, the young may be trapped inside.

If a bat is present in your home, contact an animal-control or public health agency for assistance. It may be important to capture the bat for rabies testing, especially if a potential bite or exposure has occurred. Sometimes, professional help may be unavailable. In such cases, use precautions to capture the bat safely: To begin, you will need: leather work gloves (put them on), a small box or coffee can; a piece of cardboard and some tape.

The steps you should take to capture the bat are: When the bat lands, approach it slowly, while wearing the gloves, and place the box or coffee can over it. Slide the cardboard under the container to trap the bat inside. Tape the cardboard to the container securely, and punch small holes in the cardboard, allowing the bat to breathe. When no potential exposure has occurred, the bat can be safely released outside. If a bite or exposure to saliva (e.g., into a person's mouth, eyes, or a fresh wound) has occurred, your health department or animal-control authority should be contacted to make arrangements to receive the suspect bat for rabies testing.

If you come across a dead bat, call animal control services to see if they can safely remove the animal. In some instances, such services might not be

immediately available. Under these circumstances, follow the following steps to safely discard the dead bat. Get a cardboard box or Tupperware container and place it over the bat - Slide a cardboard or plastic lid under the box/container so that the bat is confined within. Remove it from the area until animal control services can arrive to safely dispose of the bat.

While bites are a common way for diseases to be spread from bats to humans, exposure to saliva and other secretions can also lead to infection. If you are bitten or saliva from a bat gets into your eyes, nose, mouth, or wounds, wash the affected area thoroughly and get medical attention immediately. Bats have small teeth that may leave marks not easily seen. Although many people know if they have been bitten by a bat, there are certain circumstances when a person might not be aware or able to tell if a bite has occurred. For example: **If a person awakes to find a bat in the room or if you find a bat in a room with an unattended child or near a person with a disability. If this occurs, get immediate medical attention. In all circumstances, contact local or state health departments for assistance with medical advice and testing bats for rabies. When it cannot be ruled out that the bat is free from rabies and an exposure has occurred, (PEP) may need to be considered**.

When bat droppings, saliva, or other secretions are believed to be nearby, closely monitor your health, especially any fever, chills, headache, or muscle pain. If these symptoms appear after being in an area when bats might have been nearby, seek medical attention and be sure to note your presence in these areas. Be sure to also note any travel that has recently taken place, especially to African countries. This is especially important if it has been less than a month since a potential exposure to bats.

Even though bats sometimes spread diseases to people, they are able to peacefully co-exist with humans and provide us with many benefits. Worldwide, bats are a major predator of night-flying insects, including pests that cost farmers billions of dollars annually. Throughout the tropics, seed dispersal and pollination activities by bats are vital to rain forest survival. In addition, studies of bats have contributed to medical advances including the development of navigational aids for the blind. Unfortunately, many local populations of bats have been destroyed and many species are now endangered.

Volatile, synthetic pesticide poisons are unnecessary for bat control. The best way of getting rid of bats roosting in a building is through "bat-proofing", repelling them, or exclusion by netting! They may be legally protected in your

area, so you should check state and local laws before beginning any control activities. **Bat-proofing.** Making a building "bat-proof" means sealing or screening all of the openings used by the bats to enter a building. It can be a difficult job because, in many cases, all upper openings 3/8 inch and larger must be sealed, but this is the only permanent method of ridding a building of bats. Use sheet metal, aluminum flashing or 1/4" hardware cloth to close entrances permanently. **Be sure there are no bats left inside before the building is sealed.** Bats trapped inside may create even more of a pest problem than before. Pay particular attention to chimneys, cornices. louvers, shingle/shake siding, vents, warped siding and locations where the roof joins the sides and around the eaves. **June and July are peak months for bat complaints in much of the country**. Unfortunately, this is the worst time of year for control. At this time, bats are rearing young in their colony. The young can not fly and stay in the roost. Bat-proofing during this period traps the young bats. They will die and rot and smell. They may also crawl and/or flutter into living areas.

The best time of year to bat-proof your building is either in late fall after most bats have left for hibernation or in late winter and early spring before the bats arrive. If bat-proofing must be done in summer, it should be done after mid-August.

Seal all but one or two principal openings.

Wait 3 - 4 days for the bats to adjust to using the remaining openings.

Then seal those openings some evening just after the bats have left for their nightly feeding.

"Bat valves" or screens can also be used. These are placed over the remaining openings and allow the bats to leave but not to return.

Netting (lightweight bird netting) can be used - bats will crawl out but, can not reenter.

Standard bat-proofing materials include ¼" hardware cloth, screening, sheet metal, caulking, quick setting hard putty, expanding polyurethane foam, steel wool, duct tape -the same things used for rodent proofing. Copper or large stainless steel scouring pads can be used to temporarily plug openings in tile roofs, then sealed with cement, caulk or mortar later. When old, deteriorated buildings have more openings than can be sealed economically, large sections of plastic bird netting can be draped over the roof areas of these buildings to keep out bats at a reasonable cost and thus solving most bat problems immediately.

Bat repellents.. Blasts of air have been used effectively to drive bats out. Lights left on will drive them away. Turn lights on and leave the lights on when they are hibernating, and they will die. Loud noise can also be used to repel bats.

Bright lights have had some success in repelling bats.

On commercial buildings, flood lights can be pointed at the bats' entry points to keep them from entering. (Of course, the bright lights may attract insects too, which is the bats' food.)

Attics can be illuminated with four or more bulbs or flood lights **or better yet strobe lights**; ensure that all corners of the attic are illuminated.

Drafts of cool air from fans and air conditioners have, on occasion, kept bats from roosting in a poorly sealed attic.

Ultrasonic devices do not repel bats for long, so why use them? Try loud, heavy metal music and/or strobe lights.

Cleaning - Be careful to wear all of the proper clothing and protective devices and then clean up all bat droppings and then thoroughly power wash with Safe Solutions, Inc. TWEETMINT Enzyme Cleaner with Peppermint to help remove odors, ectoparasites and the like.

Glue Boards - Denny Young has found that if you must quickly remove a bat or colony because you suspect disease and/or other control methods have failed, you can do so quickly and safely with glue boards. Staple a glue board directly under the entrance hole; replace every morning as needed; when you no longer have bats, seal the entrance hole. This method may be illegal in your area! **Remember, bats are beneficial and may be legally protected in your area.**

A single bat. When a single bat finds its way into a home, office, or store, it will usually find its way out again. When it cannot, capture the bat with an insect net, a coffee can, or even (as a last resort) with a gloved hand. The bat can be released and/or destroyed. Never release a sick bat or one that is not acting normally! **Never touch any wild animal or bird! Did you know?** If you move about you scare bats and they can panic and bump into things. Bats rest from midnight to about 3 a.m., so most "invasions'" occur about 3 a.m. or just after dusk.

BED BUGS

“Take a bite out of the night!”

Bed bug infestations have become a serious problem in housing throughout the country. Bed bugs live on human and animal blood and typically hide and live in cracks and crevices in dark and undisturbed locations close to their hosts. They can live for long periods of time and although visible to the naked eye, they may be difficult to detect - Thoroughly inspect in and around sleeping and resting areas at home once a month. Look for signs of bedbug activity, active infestations will have fecal spotting, live or dead bed bugs, shed skins and/or bed bug eggs. Avoid used furniture and mattresses, especially discarded furniture and mattresses. Used furniture and refurbished mattresses may have bed bugs and bed bug eggs that are difficult to see. Inspect for the signs of bed bugs when traveling away from your home. Look for live or dead bed bugs, shed bedbug skins or bedbug eggs and fecal spots behind baseboards, on mattresses, clothing or dark cracks and crevices. Wood, metal or plastic furniture, sofas, chairs, tables and many other items may be infested with bedbugs.

If you even suspect an active bedbug infestation is found on your travels, separate and isolate in sealed plastic bags all of your exposed luggage, clothing and personal effects until a thorough inspection and decontamination can be completed. Bed bugs prefer to live in cracks and crevices in areas like baseboards, moldings, window/door frames, and cracks/seams in walls and furniture, especially headboards and bed frames and screw holes. Lightly dust these areas with Safe Solutions food-grade DE and then thoroughly seal baseboards, cracks, crevices, heat, plumbing and electrical services shared between apartments with pest-proofing sealants. Encase mattresses and box springs. Seal box springs in an appropriate zippered encasement to prevent bed bugs hiding inside from escaping; this location is commonly affected in bed bug infestations and yet difficult to inspect. Thoroughly vacuum apartment, furniture and all belongings and use crevice tools and other attachments wherever feasible. Place the contents of the vacuum in a tightly sealed disposable bag and remove. Use a steamer and\or Safe Solutions Tweetmint Enzyme Cleaners with Peppermint to clean on a weekly basis. **Early identification and reporting of infestations by residents to building management and neighbors limits the spread of bedbugs. As soon as possible contact Property Manager and/or Health Department. Report the suspected activity as soon as possible. The longer you wait the more likely the bed bug problem is to spread and the**

more difficult and costly it will be to control.

The following sequence of steps has been outlined by the Armed Forces Pest Management Board in order to facilitate control of bed bugs in their housing units. Using a vacuum cleaner (preferably HEPA-filtered), remove the bugs and their cast skins from all observed and suspected harborage sites during the initial inspection, and periodically afterward (once weekly is a suggested self-help action). The vacuum bag should be removed immediately afterward, sealed tightly inside a larger plastic bag, and that bag incinerated or placed in the next normal trash collection. Launder all infested cloth items in hot water, 120 degrees Fahrenheit or hotter for at least 10 minutes, with soap or detergent, then dry in a warm or hot dryer of at least 140 degrees for at least 20 minutes, or dry clean to kill all bedbug life stages present. Enclose each mattress and box spring in a sealed plastic cover, these types of encasements should be of high quality and bed bug puncture proof to limit exposure to house dust mites or bed bugs. Place and seal all recently laundered cloth items (e.g., bed linens, clothing) inside new large plastic bags or tightly closed bins to prevent any bedbugs from re-infesting them. Seal shut all cracks, crevices, and entry points to wall voids, using a high-quality silicone based sealant, especially within a 20 foot radius of any spot where bed bug bites have been reported, or where the bugs have actually been collected.

Additional or alternative physical control measures against bedbugs may include: heat, cold, steam, physical mashing and sticky insect monitors. A residual insecticide (the Author suggests food-grade DE) should be applied, according to label directions, to each infested site and preferably to a small area around each site. Such applications often involve treating cracks and crevices. When planning and conducting any such treatments, consider examining, if not treating, the opposite side of any involved wall, floor or ceiling. Electrical outlet boxes, and similar voids that cannot be readily sealed, should be treated with an appropriately labeled insecticidal dust.(the Author suggests food-grade DE) Consider including some type of insect growth regulator (IGR) as a concurrent or adjunctive treatment (e.g., as a tank mix). Limited use of an aerosol or ULV pyrethroid may facilitate the detection of hidden bedbugs by causing them to move around more, and may also potentially increase their exposure to any previously applied residual insecticide. DO NOT use any over-the-counter "foggers." They are not very effective and may cause bed bugs to scatter. Fumigation or heat (or cold) treatment of batches of furniture, clothing or other items within chambers may be warranted and affordable in specific cases, but whole-structure fumigation to control bedbugs is seldom practical or

economically feasible. And such treatments provide no residual effects at all. Re-inspection of infested structures and sites should be done about 10-21 days after any initial treatment, and (if needed) again about 10-21 days later, to detect, and to precisely target the treatment (if needed) of any continued infestation.

Carefully reintroduce cleaned items. Isolate and contain items that have been properly cleaned, laundered or heat treated. Heavy duty plastic bags or air tight containers may be used for this purpose. Clear bags and containers are preferable. **NEVER USE THE FOLLOWING PRODUCTS FOR BED BUG TREATMENT: Insecticide "bombs", total release foggers, camphor, kerosene, diesel, gasoline, alcohol or other similar products. These products can cause serious health problems. They are dangerous if misused and can cause fires and explosions. These products are not appropriate for bed bug management.**

Bed bugs are small, wingless insects that can feed on sleeping humans at night and are usually no more than 1/4 inch in length in their adult state and can engorge themselves with human blood in less than 15 minutes causing their bodies to fill to as much as three times its usual size. Fully engorged bed bugs bear little resemblance to their original state and are often thought to be a different insect altogether. Bed bugs can lay between one and five eggs per day with an incubation period of 10 days in warm weather (slightly longer when cool). These newly hatched bed bugs will require five significant blood feedings to reach adult size. They will molt in between feedings by shedding their exoskeleton. Once mature they quickly begin the process of laying new eggs. These nocturnal insects hide along seams of mattresses, in box springs, or in cracks and crevices near sleeping areas.

Eliminating an infestation requires removing or treating all infested material and monitoring to be sure all of the bed bugs are gone. Bed bug adults are small (about 1/5 inch), oval, and rusty red. Nymphs, or immature bed bugs, are smaller and lighter colored. Bed bugs feed only on blood and must have one blood meal prior to molting to the next, larger nymphal stage. **Adults can feed every few days but can survive many months without food. Bed bug feeding is painless**. Victims usually remain asleep. Areas around bites might redden, swell, and itch. Some people have no reaction. Bed bugs aren’t known to spread diseases, but scratching bites can lead to infections. People can carry bed bugs in luggage, clothes, bedding, furniture, or other objects and can pick them up in hotels. Hotels, homeless shelters, furnished apartments, and dormitories are most

at risk. Second-hand mattresses and furniture can also be a major source of infestation.

Detecting bed bugs. Using a flashlight and magnifying glass, look for bed bugs, their dark fecal spots, and light-brown shed skins. Focus on mattresses, box springs, bed frames, and areas around the bed. Bed bugs like to hide. Remove bedding. Look in cracks and holes. Turn furniture upside down and take apart frames if necessary. Bed bug detection traps are available – use them.

INTELLIGENT PEST MANAGEMENT® CONTROL - Remove or treat all infested materials as soon as you detect bed bugs. Vacuum along mattress seams, baseboards, and other areas. Wash all bedding and clothing in hot (120°F) water with a cup of borax and dry in a hot dryer. Consider routine steam cleaning. If possible, replace all of the infested mattresses. Specially designed mattress encasements might be helpful. Bed bugs are very sensitive to heat in all stages of their development. The thermal death point for the common bedbug is only 111° F. to 113° F.; even lower temperatures of 97° F. to 99° F. will kill large numbers of these bugs. Raising the temperature for an hour or so should eliminate most infestations. Use a steam cleaner to steam the cracks and crevices and mattress weekly using only tap water.

Bed bugs are also killed by prolonged exposure to low temperatures (32° F. to 48° F.). Even the eggs die at these temperatures within 30 to 50 days, although adults and nymphs die within hours. So by simply closing off an infested bedroom and leaving it unheated in cold weather can help eradicate any bed bug infestations, as will a proper carbon dioxide fumigation of the mattress and area. Place mattress, springs, bedding, slats and frames directly in the sun or in a plastic "bag" made of heavy visquine and duct taped together with 1# - 3# of dry ice on a paper bag on top of the mattress to "fumigate the critters". Thorough cleaning or vacuuming will help but will not completely eliminate the pests. Use a red light at night to quietly determine where they are hiding. Caulk, foam, seal and paint all hiding areas. As a last resort, dust talcum powder, medicated body powder, food-grade diatomaceous earth or Comet® into cracks and crevices of floors and baseboards and then seal completely. Clean thoroughly using diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or borax as needed.

The quickest and easiest non-chemical way to take a sizeable chunk out of a bed bug population is to throw out all infested items. Before discarding infested items, always bag or wrap them to prevent dislodgement of bed bugs on the way to the dumpster. If an old infested bed is to be kept, your best non-

chemical method of control is to place a smooth, tight-fitting, hardy (dust mite) cover over your old mattress. This is known as encasement. Encasing the mattress and box springs prevents an infestation from growing by denying bed bugs access to the hard-to-treat inner areas. You will easily be able to spot and remove new clusters of bed bugs on the smooth cover, and bed bugs that happen to be inside the cover become entombed and will eventually die. Using a vacuum to target infested bed bug harborages can be useful if it is done properly. **Keep in mind that while vacuuming may reduce surface populations, it will not reach bed bugs located in deep crevices. Because bed bugs and their eggs cling tightly to surfaces, it is best to scrape the end of the vacuum repeatedly over the target area.** Do not use a brush attachment, as some bed bugs and eggs will remain alive in the bristles and be transferred to other areas of the home. After vacuuming, the vacuum bag should be removed, sealed tightly in a garbage bag, and discarded immediately to control for bed bugs and eggs that may have survived the ride down the suction hose. **Temperatures of 120 degrees F are lethal to bed bugs (as well as most other insects),** and the use of a steamer that kills both bed bugs and eggs on contact. The best steamer to use for bed bugs is one that emits very little moisture and has a large brush head. Steam vapors should be too hot to touch to be effective. A towel wrapped around the brush head will intensify hot vapors which can be checked with a digital infrared thermometer. The steamer head should be directly over the surface being treated. **Finished wood surfaces or other items that might be damaged by high heat should not be treated with the steaming technique**.

When bed bugs manage to infest personal items such as bedding and clothing that cannot or should not be treated with pesticide POISONS, a great non-chemical treatment is to simply wash and dry these items on the hottest possible setting. The typical dryer will reach up to 180 degrees F ten minutes into its cycle, a temperature that is lethal to bed bugs and their eggs. Other items that can be treated in the washer and dryer, or just the dryer alone include soft toys, rugs, backpacks, and footwear. **Heat** - Wrapping infested items in black plastic and placing them outside on the pavement in direct sunlight will de-infest mattresses, furniture, and other belongings. A thermometer should be used to monitor temperatures inside the plastic. The temperature must be at least 120 degrees F inside the bag for this method to be effective. **Cold** - In colder locations, freezing may also be a non-chemical way to de-infest belongings. This method is more difficult to utilize since freezing bed bugs requires that they remain for two weeks at temperatures below 0 degrees F. **In most cases and locations, heating is a more realistic option.**

Steam clean with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or borax and/or throw out mattresses, furnishings, debris and other objects that serve as nesting sites. Routinely vacuum lint, dust and other debris from mattresses, covers and box springs. Caulk all cracks, holes, gaps and openings in walls and moldings. Re-glue all loose wallpaper. Launder and dry all linens, bedding and pads in a clothes dryer or in direct sunlight. If determined necessary later, treat bed frames, springs and mattresses with only small spot applications of talcum powder, or better yet, medicated body powder or Comet®; then as a last resort, insecticidal soap or food-grade diatomaceous earth. **Wash or spray any mattresses and/or bedding with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per quart of water) and/or 2 oz. of borax per quart of water.**

You can spot treat mattresses that must be saved at seams, folds, buttons or tears with diluted borax (½ cup per gallon of water) or better yet, simply with a steamer weekly. After treatment the mattress should be air dried in the sun, and then covered with plastic before use. If all else fails, carefully and lightly apply talcum powder, medicated body powder, Comet®, boric acid, food-grade diatomaceous earth dusts in any/all inaccessible areas; then caulk and/or seal and/or completely cover. **Remember that thoroughness is the key to permanent bed bug control**. All holes, cracks, crevices or other hiding places must be carefully sealed/caulked. Routinely wash everything with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint, and/or borax. Freshwater (food-grade) diatomaceous earth will control most ectoparasites of this type, but you should avoid breathing the dust. Try lightly dusting with baby powder containing talc first, but you still should avoid breathing the dust. Call 1-888-443-8738 for food-grade DE or Tweetmint enzyme cleaners. Remove infested materials, and seal hiding spots. Thoroughly inspect after treatment to be sure all the bed bugs are gone.

Duct Tape - Place (Gorilla Brand) duct tape, sticky-side up, around all walls and bed legs and wherever you suspect bed bug activity. You can hold the duct tape in place with masking tape on the edges.

CAUTION - Never apply volatile, residual synthetic pesticide poison sprays or dusts to an infant's, pregnant woman's, elderly person's or an invalid's mattress or anywhere people have breathing problems or are chemically sensitive. Use several applications spread (over a period of two to six weeks intervals) of diluted Tweetmint enzyme cleaners and/or borax, or as a last resort, some food-grade DE, but only when the label permits such usage,

and only if you cannot simply throw away the infested mattress and everything else has failed to gain control.

In concluding any bed bug eradication, thoroughly inspect all attics and other possible harborage points for bats, rodents and birds. If found, clean up all guano and residue with enzymes, remove nests, spray or mist with Safe Solutions, Inc. Enzyme Cleaner with Peppermint (1 - 2 oz. per gallon of water and/or borax, ½ cup per gallon of water). If determined absolutely necessary, spot treat the area with a least-toxic food-grade DE. Caution: Wear hard hats, safety glasses, masks, gloves and wash all protective clothing and yourself thoroughly after entering any infested attics, especially any with any visible feces or guano. Clean thoroughly with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or borax.

Summary - Using Heat/Cold - Place all suspected/infested garments and bedding in the dryer. Infested fabrics that are able to be laundered should be placed in a clothes dryer set to high heat for 10 to 20 minutes "Dry-clean only" garments can usually go through a dryer cycle safely as long as they are completely dry at the start and the dryer is only set to medium heat, which is less than 160 degrees Fahrenheit. Heat is an effective way to kill bed bugs, but garments must be laundered at temperatures of 120 degrees Fahrenheit in order for the heat treatment to be effective. Avoid taking your garments to a dry-cleaner. Dry-cleaning your garments will usually kill the bugs, but your infested garments may cause a bed bug outbreak at the dry-cleaners. Allow furniture to sit out in direct sunlight. Upholstered furniture, rugs, and other fabrics that cannot by washed or dried can be placed outdoors on a hot, sunny day. Loosely wrap the item in black plastic bag material. Any plastic will work, but dark colors absorb more heat, so a black plastic bag is ideal. Place the wrapped item in direct sunlight. Choose the sunniest, hottest day possible. Let the wrapped item sit in that position for at least 24 hours, if not longer. The internal temperature of the bagged item needs to reach 120 degrees Fahrenheit (49 degrees Celsius) or higher. Freeze furniture, instead. If your bed bug problem occurs in the middle of winter, you can use freezing temperatures to kill bed bugs, as well. Wrap each infested item in plastic bag material. Sit it in a shaded area on the coldest winter day possible. Note that this method will take longer than sitting your furnishings out in the sun. If the temperature is consistently at 0 degrees Fahrenheit, you will need to wait two to four days. If temperatures reach up to 20 degrees Fahrenheit, you will need to wait for about a week.

You can use a portable heating device. A portable heating device designed to kill bed bugs can be difficult to find and may cost you $300 or more. A portable

bed bug heater is large enough to treat items like suitcases, backpacks, clothing, sleeping bags, purses, pillows, and shoes. Place your items on the support rack inside the device and follow the instructions to heat the interior. The heat will automatically turn off when the cycle is complete. **Note that a portable heating device is ineffective at treating an entire room or large space.** A professional steamer session can range in price from $300 to $1200. Steaming takes a long time to complete, and the temperature of the steam must reach 160 to 180 degrees Fahrenheit. One of the most effective treatments is the use of a whole room heating system. Industrial heaters heat the air inside an entire space to a temperature between 120 and 135 degrees Fahrenheit. **Note turning up the heat in your home will not accomplish the same results as a professional heating session.**

Using Safe Solutions Enzyme Cleaners with Peppermint. The wetter you make the pest the better.

Unconventional Treatments – You can simply vacuum away the bed bugs. Use your vacuum cleaner to remove and visible bed bugs. During any active infestation, you should also regularly vacuum all carpets, rugs, beds, and other upholstered furnishings. While vacuuming may seem like an obvious remedy, it is fairly unconventional in the sense that it does not usually prove effective against the majority of the bed bugs in a contained area. **Due to its low level of effectiveness, it is generally not recommended as a sole treatment. Vacuuming can, however, increase the effectiveness of all other treatments**. The reason that this treatment does not kill all bed bugs is simply that a vacuum cleaner is unable to reach all the places that bed bugs might hide out in. To improve your success rate, make sure to get in all cracks and crevices, and scrape the vacuum against all fabric surfaces to yank any eggs or stubborn adult bugs up. Place the contents of the vacuum inside a sealed plastic bag when done. Placing the bag in direct sunlight for several hours to days may help kill any of the bugs that managed to survive the vacuuming. Wear a mask and spread Safe Solutions Food-Grade Diatomaceous Earth (DE). Apply a thin layer of this food-grade DE powder around problem areas, including both known and suspected hiding places. Gently rub the DE powder into carpeted areas so that it gets deeper into the carpet and bedding. Cover the mattress with a dust mite/bed bug cover. This food-grade product is made from ground, fossilized shells. In fact, it is sometimes labeled as "fossil shell flour" or "bed bug dust." Once a bed bug crawls through the dust, it immediately becomes dehydrated. Infected bugs should die within a few hours.

Use Safe Solutions food-grade Diatomaceous Earth. There are some DE

products marketed for use in swimming pools, and this can prove dangerous to humans. Safe Solutions Food-grade DE should be perfectly safe, though. Create a barrier of kidney bean leaves. If the problem is still fairly minor, you could try killing off a small population of bed bugs by scattering the leaves of the kidney bean plant around your bed, couch, or other problem locations. Kidney bean leaves have microscopic hairs that hook the bed bugs' legs at their weakest points. Bed bugs that try to escape will be killed when their trapped leg is ripped off. Most bed bugs, however, will remain trapped. From there the leaves and the bugs can be burned. The Author recommends using duct tape placed sticky side up and held in place with masking tape. Take a dewormer. Studies suggest that a minimal dose of a prescription deworming agent known as ivermectin is effective at killing roughly 60 percent of bed bugs within a contaminated area. Note that these studies only began in December 2012, and unless they are officially accepted within the scientific community, your doctor may not be willing to prescribe ivermectin for your bed bug problem. Ivermectin is considered to be a "safe" drug, and is used in deworming medications for both humans and animals. This remedy relies on a technique called "xenointoxication." If using this solution, you would take a dewormer before going to sleep. The bed bugs will bite you in the middle of the night, as usual, but will die within a few days since the dewormer will be transmitted to them through your blood. The Author asks you to consider what a toxic dewormer does to you – try the other alternatives first!

BIRDS

Few people ordinarily think of birds as pests, but when birds gather in too great a number or defecate in places where they don't belong, they can become a nuisance, and sometimes even pose a safety or health hazard. There are three bird species classified as pests: the pigeon, the house sparrow, and the starling. These birds can be controlled by any lawful means (including killing), by any properly certified pest management professional. (Most often, however, non-lethal control measures such as frightening, netting, tactile devices, and exclusion are used rather than actually killing pest birds.)

All birds other than the three mentioned above come under the heading of "nuisance animals," rather than pests, and can only be controlled when they are creating a problem, and only by non-lethal means. Birds are protected by many laws and regulations. Although pigeons, starlings, and house sparrows are not directly protected by federal law, their control is often strictly regulated by state and local governments. **Public opinion is often strongly against any control measure that kills any birds, even pest birds**. Non-lethal bird control methods include habitat modification limiting food, water, and shelter), exclusion (with netting, porcupine wire, sticky repellents, etc.), and trapping.

Birds roosting in your home can cause many problems. Their droppings are messy, the birds may damage property, the nests are often unsightly and birds may carry parasites and diseases that can be passed to you, your family and/or pets. Getting rid of the birds is a matter of removing their basic needs: shelter, food, water and safety. When you have made your home an unsuitable nesting place, the birds will seek different nesting places. Hang visual deterrents near the nesting area. Good choices are helium-filled foil balloons, windsocks, balloons with predator eyes painted on them, whirligigs, or long aluminum or shiny strips that will blow in the breeze. Another option is a commercially available scare device on springs with holographic eyes attached, giving the illusion of a moving predator whose eyes follow the birds. Plastic owls or hawks have been shown to be ineffective over time, as the birds grow accustomed to them, but if they are moved every few days, they may help. Play sonic deterrents such as the bird's warning/distress call followed by a predator's cry or other loud or frightening sounds. Iowa State Extension recommends playing the sounds for ten to fifteen seconds of every minute just as the first birds are nesting for the

evening, and then continue until dark. Repeat this procedure nightly until the birds move. Installing a sonic repellent triggered by a motion sensor will keep the birds from becoming acclimated to a sound. Attach hardware cloth or netting from the edge of the eaves to the wall to block access to the nesting areas. However, wait to evict the birds until after the young have learned to fly so you don't trap any birds in your eaves. Another option is to prevent birds from roosting by installing bird spikes under or on eaves. The Author has kept birds away simply by stringing fish line over the nesting areas and/or to keep sea gulls from landing/flying in certain areas. Remove all food and water sources from the area if possible. Determine what food the birds prefer and keep it out of feeders, or eliminate feeders entirely. Cover grain bins and remove plants that bear nuts or berries from the vicinity of your home.

Intelligent Pest Management® Bird Control Summary - (Only if you totally eliminate all the nesting and roosting sites on a building, tree, statue or whatever; will you eliminate bird problems.)

Holes - The simple closing of holes in buildings can solve many bird problems.

Nest cleanup - Birds can nest deep in dryer vent airflow lines or other openings up to a depth of 15 feet. A simple technique to clean out the nests is to use an industrial vacuum and a flexible copper pipe to slowly pull out the nesting material; then clean the vent with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint and close off any openings with ½" hardware cloth or place flashing around any other openings, i.e., damaged dock doors that are not in use. Once all of the holes are blocked or netted, the birds will no longer come into the building.

Install plastic curtains or nets on any doors that are open all day. The secret to finding the problem may be the top of the dock doors. Wherever there is a 1" or greater gap, birds are able to enter the building. Plastic netting can be used to prevent birds from constantly flying into a warehouse, landfill, court yard, etc. InterNet (1-800-328-8456) has a product line which features a selection of netting from heavy-duty grids to smaller mesh sizes to meet a variety of needs. Bird netting can be ordered in custom sizes or rolls and easily fabricated to fit most building installations and to seal off areas that attract birds. Helpful installation hints are also included in a descriptive application brochure available from InterNet. Hot Foot Mist Nets, 8' x 40', are very fine nets constructed of strong fibers that birds cannot see. The nets have a unique "pouch" construction, when the birds fly into the net, their feathers become entangled, thereby safely immobilizing them for removal. Different mesh sizes are available for birds of

different sizes and the nets can be joined together to cover a greater area. If you have any questions call Hot Foot @ 1-800-533-8421.

Roosting on ledges can be discouraged by changing the ledge angle to 45^{o} or more. Sheet metal, Styrofoam blocks, wood, stone, etc. can be formed and fastened to ledges to achieve the desired angle.

Building ventilators should be completely netted over using plastic netting to prevent birds from crowding their nests into ventilator slits.

Commercial signs should all be repaired and/or screened to prevent any bird roosting space.

All broken windows should be repaired, sealed off or screened.

Warehouse doorways that must be left open and/or used frequently during the work day should be screened or blocked to birds by hanging clear plastic strips to the ground in front of the opening. These strips will not impede the warehouse workers' activities, but will present an impassable barrier to the eyes of any bird.

All places or openings between window air conditioners and the building should be blocked off or screened.

In locations where birds are utilizing palm trees for nesting sites, the frequent removal of the dead fronds from the trees will aid in eliminating bird roosting sites (as well as roof rat harborage).

Likewise, if birds are using building vines, the vines can be removed from building sides or covered with inconspicuous plastic nets (in most cases, black is the most inconspicuous color choice).

There are four different types of bird repellents: (1) tactile (touch), (2) sound, (3) odor and (4) visual.

For most urban and industrial bird problems, the tactile repellents are the most practical and effective. There are two types: (1) mechanical and (2) chemical. Porcupine wires (Nixalite™ and Cat Claw™ permanent types of mechanical repellents. They are composed of myriad spring-tempered nickel stainless steel prongs with sharp points extending outward at all angles. The prongs are fastened to a solid base which can be installed on window sills, ledges, eaves, roof peaks, ornamental architectural features or wherever birds are prone to roost. The sharp pointed wires inflict temporary discomfort, so birds avoid landing on these surfaces. All ledges and other niches must be completely covered in order for these devices to be completely effective. Wide surfaces may require two or more parallel rows of wires or strings.

A Successful Bird Control Program Usually Consists Of The Following Elements

Sanitation and habitat modification, to reduce the availability of all food, water, and shelter around sensitive areas.

Education (telling people why feeding the pigeons or seagulls is a bad idea).

Structural modifications, such as sealing bird access points, installing netting, and installing tactile repellent devices on roosting areas.

In some cases, fright devices may be useful.

Finally, areas previously infested with birds must be carefully and thoroughly decontaminated to remove droppings, feathers, pathogens, and parasites. Be careful to wear all of the proper clothing and protective devices and then clean up all bird droppings and nesting materials.

Then thoroughly power wash with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 - 2 oz. per gallon of water) to remove stains, odors, ectoparasites and the like.

CATS

The very best way to safely remove cats from messing in your sandbox, garden, driveway, or crawling around on your furniture – is to simply spray them with a little water. You can use a hose, a Super Soaker squirt gun or anything that will give you a little accuracy. Once you hit them they will normally run away and you will not really have harmed them.

If you really need to remove a "wild"/feral/stray cat from your property; you need to get a live animal trap from a vet, the humane society, or if all else fails, buy one from the hardware store. Bait it with some cat food (part of a can of tuna or sardines will work), and then call the humane society or animal control to come out and get the cat. They will know what to do and exactly how to do it. Stray cats are truly wild animals, and if a cat is born in the wild and lives as a wild animal, there's pretty much no chance of you domesticating it. Many cats form feral colonies. Cats in the wild rarely live more than 2-3 years, whereas pampered house cats can live up to 15 years. Cats are carnivores, and eat almost entirely protein. They need to hunt and catch prey, such as rodents, birds, etc. The truth is that many feral cats actually survive on garbage, and more often than not, human handouts. Most people don't want to see even feral/stray cats trapped and ultimately euthanized (this is because most "wild cats when they are sent to a shelter are usually unadoptable due to their fear of humans). However, overpopulated cat colonies usually result in even more needless suffering for cats. **The best thing is prevention: don't feed the "wild" cats, don't ever abandon your own pet cat, and ALWAYS HAVE YOUR CAT SPAYED OR NEUTERED.**

CAT URINE -Soak up as much cat urine as you can with a rag or paper towel. Cat urine odor is usually easily removed by blotting the spot with a soft cloth or paper towel (do not scrub or wipe too hard). Then either create a solution of one part water and one part white distilled vinegar or diluted 10% Safe Solutions Tweetmint Enzyme Cleaner in a bowl and then soak a cloth in the cleaning solution - remember to hold the cloth over the spot for a while, preferably overnight and let your cleaning solution thoroughly soak into the area. **The very best way to get rid of cat urine odor is to get rid of all the cats!**

CHIGGERS

Chiggers (also called harvest mites or red mites) are tiny red, biting mites. Chigger bites aren't painful, but people do get intense itching shortly after being bitten by a chigger. Chiggers are members of the arachnid family (the same family that includes spiders and scorpions). They are smaller than a period at the end of this sentence. Most can only be seen with a magnifying glass. Chiggers are found all over the outdoors, including in grassy fields, along lakes and streams, and in forests. It's the baby chiggers that bite people and animals. Chiggers have tiny claws that allow them to attach tightly to people and animals. Once attached, a chigger pierces the skin and injects its saliva. The saliva contains digestive juices that dissolve skin cells. The chigger then eats the dissolved cells. After a couple of days the chigger falls off, leaving a red bump on the skin. Chigger bites are itchy red bumps that can look like pimples, blisters, or small hives. They are usually found around the waist, ankles, or in warm skin folds. They get bigger and itchier over several days, and often appear in groups. Wash chigger bites vigorously with soap and water to help remove any chiggers that are still attached to the skin. Calamine lotion or anti-itch creams can help with the itching. You can also get some relief by holding a cool washcloth over the bites. **Try not to scratch the bites because scratching can cause a bite to become infected.**

Chiggers are unique among mites affecting humans and animals in that the immature stage (the larva) is the only parasitic stage. The six-legged larva may attach itself to a variety of hosts to feed. Once engorged, it leaves the host to become a nymph and eventually an adult; both nymph and adult are eight-legged. It is likely that nymphs and adults feed on insect eggs or small, soft and inactive soil invertebrates. The common North American chiggers require 50 to 70 days to develop from egg to adult. Typical host-seeking behavior by the larva consists of congregating in a shaded area near the top of an object in close contact with the earth, such as a blade of grass or a fallen leaf. Here they are activated by an increase in carbon dioxide as a vertebrate host approaches. People who have been outdoors in chigger-infested vegetated areas may suffer intense itching 3 to 6 hours after exposure, followed by a dermatitis (skin inflammation). A careful search of the skin after a trip through tall grass, weeds, or berry brambles will reveal very minute, red mites, either moving fast or attached to the skin. The itching is usually along sock tops, behind the knee, around the waistband, or other places where clothing fits tightly, although most bites occur below the knees. The itching may persist for many days. Chigger

larvae do not burrow into the skin, nor do they feed primarily on blood. Their food usually consists of watery elements of tissue broken down by their digestive fluids; a few blood cells may be ingested. During larval feeding, the skin of the host becomes hardened, and a tube forms in which the mouthparts remain until feeding stops. It is probably the action of the digestive fluid that causes itching at the site of mouthpart attachment. You may not know that you have been attacked by chiggers until welts appear and itching begins. Take a bath in epsom salts or with Safe Solutions Tweetmint Enzyme Cleaner or their Lice R Gone Shampoo as soon as possible upon returning from a chigger-infested area. Apply a thick lather, rinse, and then repeat. This action kills most attached chiggers and ones not yet attached and stops most of the itching. Next, apply an antiseptic to the welts; this kills any remaining chiggers and prevents infection. Spray the yard with diluted dish soap and vegetable oil (4 tablespoons of dish soap and 4 teaspoons of vegetable oil per gallon of water) or diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 -2 oz. per gallon of water).

To treat the pain of chigger bites: simply rub bite with a moist aspirin tablet (if you are not allergic to this product). Many home remedies for chigger bites are based upon the incorrect belief that chiggers burrow into and remain in the skin. Nail polish, alcohol, and bleach have been applied to the bites to attempt to "suffocate" or kill the chiggers. But because the chiggers are not present in the skin, these methods are not effective. Proper treatment for chigger bites is directed toward relieving the itching and inflammation. Calamine lotion and /or corticosteroid creams may be used to control itching. Oral antihistamines, such as Benadryl, may also be used for symptom relief.

COCKROACHES

Cockroaches thrive in warm environments that provide them with food, water, and shelter. Roaches hide in cracks, crawl spaces, and other dark places during the day and come out at night to feed. Pesticide POISON sprays alone will not control roaches and are not usually required. Baits provide better control. You must integrate several strategies to make your home a less roach-friendly environment. **Thoroughness is essential for effective control**. The best defense against cockroaches is a clean kitchen and bathroom. If roaches are a problem in your home or apartment, vacuum well and wash the area with Safe Solutions Enzyme Cleaner with Peppermint. Dispose of the vacuum cleaner bag in a sealed container. It helps if you properly identify your cockroach species first: Effective management options can greatly vary according to species. Cockroach traps provide an easy way to catch roaches for identification. Control practices for outdoor invaders (American, oriental roaches) and indoor residents (brownbanded and German roaches) differ. For help with identification go to: www.stephentvedten.com/27_Roaches.pdf.

There are at least 4,000 species of cockroaches in the world and there are at least 70 described species in the U. S. with at least 41 described species just in Florida, but less than 1% of the known cockroaches invade and inhabit our buildings in order to become persistent, unsightly and troublesome pests. Household cockroaches are known carriers of fungi, viruses, protozoa, about 40 species of bacteria pathogenic to vertebrates and intermediate hosts for several species of helminth (flatworms). Cockroaches are considered one of the most adaptable and successful pest insect groups. In fact, evidence of the continual coexistence with people throughout history is testimony to how adaptable some cockroaches are to the habits of people. Cockroaches are born inebriates and omnivorous scavengers. Our buildings protect cockroaches from the weather and their natural enemies and provide them with ample sources of food and water as well as convenient places for them to hide.

Note: One pair of cockroaches can theoretically produce enough offspring in one year to carpet the floors of the average home to a depth of 1 meter per year! In August, 1997, the Journal of Economic Entomology noted: "Even with the promotion of integrated pest management programs for the German cockroach, *Blattela germanic*a (L.) The pest control industry has generally relied on the use of chemically-based synthetic insecticide POISONS as the key, direct control technique in these integrated pest management (IPM) programs (Gold

1995). The financial backbone of the pest control industry for years has been the "need" for continual chemical cockroach "control."

Cockroaches have survived for more than 350 million years. Ancient fossils had the same appearance as today's cockroaches: oval and flat with long legs and antennae. The modern cockroach also has the same need for a warm, moist climate. Cockroaches are behaviorally, physiologically and genetically adaptable. While most cockroaches live wild in the tropics and sub-tropics, a few, called urban cockroaches, choose to enjoy the moist, even temperatures we maintain in our homes, schools and workplaces. Cockroaches are offensive pests visually and they expel unpleasant smelling secretions that spoil the flavor of our food and contaminate our ambient air and are suspected of transporting various disease organisms in much the same way as flies. Their very presence increases asthma problems. **They feed normally in packs, or aggregations. Remove all visible food and water sources:** Even tiny crumbs or liquids in cracks provide good food sources. Store food in sealed containers. Keep trash in containers with tight lids. Eliminate plumbing leaks. Vacuum cracks and crevices and clean floors and counters with Safe Solutions Tweetmint Enzyme Cleaner and water daily. **Remove roach hiding places**: Seal cracks and other openings to prevent invaders from the outside.

Seal cracks in false bottoms of cupboards and other indoor hiding places. Seal or clean up other areas where you find roaches or their egg cases hiding. Remove old newspapers, boxes and other clutter in kitchens and bathrooms. The oriental cockroach hides outdoors under ivy and other shelter. Check to see if you have this roach and remove outdoor hiding places or bait. **Use traps to identify and track cockroach populations**: Duct Tape and Cockroach pheromone traps are available in hardware stores. Place duct tape (sticky side up held in place with masking tape) and/or traps on the floor around edges of walls, in cupboards and other places where you think roaches are foraging. Place bait stations at locations where you trap roaches. Check traps daily. Sticky traps with pheromones may provide some control of German cockroaches. **Can not find pheromones? Simply use some roach poop!**

Note: There is a difference of opinion on the classification of cockroaches. According to many experts, cockroaches belong to the insect order Orthoptera, yet other experts consider cockroaches and praying mantids to belong to a separate order, the Dictyoptera, still others say Blattodea is the correct order but, however you classify them scientifically, everyone seems to agree they are considered to be one of our main insect pests, and a continual source of concern and embarrassment for many people!

Most cockroaches are fond of flour, German roaches prefer brown sugar or light Karo Syrup to pure sucrose and carbohydrates to proteins. They also love bread, stale beer, wine, fatty acids, alcohols, peanut butter and are attracted to ground up roaches and their own excrement. Remember this when you mix up your 5% food-grade DE/borax/boric acid/sodium borate baits - **be careful to put them out of the reach of pets, children and wildlife.**

Be sure all visible cracks and crevices are caulked and strong fans are left on 24 hours a day in all active areas. Remove all paper bags, cardboard and infested fiberglass insulation. Install and properly maintain fans or air conditioners and/or dehumidifier(s). **Repair or remove all moisture sources.**

Routinely clean or spray or mist or power wash with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per gallon), all garbage cans and flood all garbage disposals, grease pits and all drains with the enzyme cleaner (1 oz. per quart) as needed. Maintain routine and thorough sanitation and proper food and garbage storage. Spray, clean and completely drain all steamers or steam tables. Do not leave garbage or any food out at night! You can also rinse-and-vac and/or power wash all surfaces and cracks with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (2 oz. per gallon). This will not only control the roaches, but it will also remove the roach allergens and roach stench. Caulk/seal every opening, crack or crevice you see cockroaches come out of.

Lightly dust with baking powder or talcum powder or medicated powder or food-grade DE or Comet® along the edges of the room and in any remaining cracks and crevices - or spray them with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per quart) or blow hot air from a hair dryer or heat gun into the cracks where you see cockroaches. **Then caulk.**

Mix 45% baking soda and 45% powdered sugar and 10% powdered yeast (or powdered vitamin C) and place as a bait mix. Make some 10% sucrose and 4% food-grade DE liquid baits and place them out of reach of children and pets. Place pheromone traps or duct tape (sticky-side up) wherever you see roaches. Remove all paper bags, cardboard and fiberglass insulation!

Spray or mist roaches with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per quart). Try spraying diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint in a power washer or steam clean. **If you control the harborage, you will control the roaches, so caulk and seal!**

Mop the floors with ½ cup borax per gallon of hot water. **Keep crawling**

children off the borax treated floor!

One hour after dark, enter the room/home/building with a red/yellow light and a vacuum or a Rinse and Vac. Vacuum up all visible roaches before turning on the regular lights. If you are using a dry vac, add 1 teaspoon of cornstarch or food-grade DE or talcum powder to the bag to kill the roaches. If you are using a rinse-and-vac, have some soapy or Tweetmint enzyme water in the container to kill the roaches. (You will take about 90% of your roach pests the first night.) Repeat once a week for several weeks or until all activity ceases. Flush or remove (or seal in plastic) all recycling materials daily.

Make some roach (wasp) traps by cutting the top off of a 2-liter (clear) plastic soda pop bottle, cut in a straight line where the bottle begins to curve, put a little petroleum jelly around the **inside** edge (**Be careful not to get any on the outside.**) of the bottle and invert the top and put it back inside the bottle (like a funnel), then duct tape the edges to keep the top from falling inside and the roaches from escaping. Put some masking tape on the outside from the bottom to the top, so the roaches can climb up and into your trap. Put some dry dog kibble or 2" - 3" of beer or wine or a piece of bread soaked in beer or a pheromone attractant (or some roach droppings) in the bottom and place under sinks, in corners, and wherever you see roaches. You can use this trap to monitor and/or control. If you leave a small (clear) strip or one side open, you can visually inspect your roach trap. You can either freeze the contents or pour in diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per quart of water) or hot soapy water. Empty out and reset, or throw away and make some more.

Create escape-proof barriers with double-sided (Mr. Sticky®) sticky tape or Vaseline® petroleum jelly or (Gorilla Band) duct tape (sticky side up). **You can literally trap and remove all roach problems with enough duct tape**.

For roaches in appliances, seal the entire appliance in a plastic bag for 2 weeks; the roaches will die from dehydration, or speed up the process by filling the bag with carbon dioxide.

Note: Quite often a health inspector will assume you have a serious roach infestation if they see one dead cockroach in a trap, so always replace traps as needed with (empty) pheromone traps.

Conclusion: Whenever food and water are easy to find, roaches will invite themselves to dinner. Here's how to cancel their reservations and get rid of roaches: Dry up any standing water around sinks, tubs, drains and toilets. Turn on fans 24/7 and properly use air conditioners and dehumidifiers. Roaches can

only live a week without water. Meticulously clean your kitchen, including crumbs in or on the stove, microwave, and refrigerator using Safe Solutions Tweetmint Enzyme Cleaner with Peppermint and water. Vacuum scraps of food from corners and around the cabinet bases. Weekly wipe down cupboard insides and drawers with Safe Solutions Tweetmint Enzyme Cleaner with Peppermint and water. Immediately clean and put away dirty dishes. If you still have a problem vacuum them all up at night using the red light technique.

Alternative Controls

Make a roach dough by combining ½ cup powdered sugar and ¼ cup shortening or bacon drippings. Add ½ cup onions, ½ cup flour and 8 oz. baking soda. (Don't forget to add some roach droppings.) Add enough water to make a dough-like consistency. Make balls of bait and put them wherever you see roaches.

Mix one clove garlic, one onion, one tablespoon of cayenne pepper and a quart of water. Steep for one hour, Create sachets of catnip and place them throughout the infested area (your cat will love you!). Cockroaches like high places, so put a few sachets on top of shelves and other elevated surfaces. Bay leaves, cucumbers, and garlic can also help repel cockroaches away, so strain, add a tablespoon of liquid soap and spray it around the house for roach control.

Place bay leaves or talcum powder or baking soda around cracks in rooms or spray with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per quart of water).

If you find a roach infestation in a computer, radio, television, wheel chair, etc., simply place the entire item/appliance in a sealed plastic bag for 2 weeks. The roaches will die from dehydration.

Boric acid powder {or better yet, food-grade diatomaceous Earth (DE)} blown into cracks, crevices, hollow walls, under refrigerators, or other undisturbed hiding places is very effective (allow seven days or more for an effect to be seen)

Bait stations containing boric acid or borax or aspartame placed near hiding places can be effective if other food sources are removed (allow seven days or more for an effect to be seen). Replace stations as needed as long as roaches are being caught.

Leaving fans on 24/7 for several weeks and mopping the floors with 1/2 cup borax per gallon during that time will quickly kill them.

Insecticide POISON sprays alone will not and do not give long-term control. They are not even necessary if other methods such as baits, traps and boric acid powder or food-grade DE are combined along with cleanup and removal of hiding places. Contact a professional pest control operator for very serious infestations, but be sure they use the Author's intelligent pest management® program as described above.

CLOTHES MOTHS AND OTHER FABRIC PESTS

These pests normally will not attack clean clothes or fabric.

Fabric pests include clothes moths, silverfish, carpet beetles and psocids. Clothes moths and carpet beetles can be serious fabric pests, damaging a variety of materials, mainly of animal origin. In nature these fabric pest insects perform an important "clean-up" function whereby dried parts of dead animals (e.g. feathers, furs, hides, horns, beaks) are recycled. While some materials of animal origin (e.g. woolen carpets) may be "treated" or "proofed" against such fabric pest insects during manufacture, many materials are not. Within buildings, clothes moths and carpet beetles feed on and exploit a wide range of animals origin, including wool in carpets, insect collections, clothing and furnishings, silks, fur, felt, and sometimes food products of animal origin, such as fishmeal. Even synthetic fabrics may be attacked by fabric pests if they are made attractive by contaminants such as urine, perspiration and food or drink stains.

Be sure to dry clean or wash your clothes before putting them away and they will be pest free. Thoroughly air out dry cleaned clothing before storing in bedroom closet. The chemical odor can cause severe symptoms in some chemically sensitive individuals.**

Routinely clean the entire area with (1 oz. per gallon) Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint or natural soaps or steam clean.

Mix ½ pound dried rosemary, ½ pound dried mint, ¼ pound dried ginseng and 2 tablespoons cloves and put in cheese cloth bags to be used as sachets. (You should be able to purchase these items at bulk cooking/baking supply stores or health food stores, or find someone who has an herb garden.)

Try sachets of any of the following: dried lemon peels, dried lavender, bay leaves, whole cloves, cedar chips, dried rosemary and mint or whole peppercorns. (Find someone who has a garden to provide you with the scented herbs or plant them for your own use.)

Lightly dust cracks and crevices lightly with Safe Solutions food-grade DE or baking soda or talcum powder or Comet®.

Do not use mothballs in any closet! The Author believes mothballs contain a terribly dangerous and volatile, registered pesticide called paradichlorobenzene that does not control moths, but can harm you.

Dry cleaning fluid contains perchlorethylene, tetra or trichlorethylene which can cause serious medical symptoms in many chemically sensitive individuals. Always try to air out dry cleaned clothing, very thoroughly, before bringing it back into your home, placing in a closet; always try to avoid putting such clothes in the bedroom. **Try to find a cleaner that does not use these toxic chemicals.**

Generally only stored fabrics or organic materials that have been undisturbed for long periods of time are the items most damaged. The best prevention is to inspect materials that contain animal fibers regularly and to store them only after they have been at least yearly brushed and cleaned appropriately. Stored items should be kept in tightly sealed chests or storage closets. Many people like to store fabrics in cedar chests, which is fine. However, most types of cedar chests and closets are only marginally effective against fabric pests and that is for fabrics that are initially free from these pests. Over time, the repellent benefits of the oils lessens. If using cedar closets, clutter should be kept to a minimum to allow the volatile cedar oils to be most effective. If you find fabrics that are “moth-eaten” look in places where carpet beetle and clothes moth are likely to be found. Check corners around rugs, under furniture and in woolen and silk clothes that have not been moved for a long time in closets. Cleaning is your best option to eliminate an infestation or prevent one and your vacuum often is your very best weapon. When cleaning, pay close attention to areas where lint accumulates, around furniture and in the corners of rooms. If you are cleaning an active infestation, be sure to dispose of the contents of the vacuum cleaner bag outside. Clean or dispose of infested materials. For items that can not be discarded or cleaned well, consider placing the infested items in a freezer for one week. Periodic brushing and sunning of stored fabrics is also helpful in prevention and control**. If you have to kill them NOW; either clean or spray using an ounce of Safe Solutions Enzyme Cleaner with Peppermint per quart of water.**

CODLING MOTHS

You might not know their proper names, but you've probably met codling moths before. Codling moths sound kind of cute and fluttery; you have met them as the "worm" in your apple. Codling moth larvae are a major garden and agricultural pests. The codling larvae attacks apple orchards and also crab apples, pears, walnut and other fruit trees. Codling moth, the infamous "worm" in your apple, is difficult to manage in the home orchard. Soon after hatching, caterpillars bore into apples, pears, or walnuts and feed, leaving reddish-brown droppings (frass). Early-maturing fruit varieties are less likely to suffer damage. To repel them - use a cheesecloth square full of lavender, chives and garlic, or cedar chips. Try adding cedar oil, rosemary, dried lemon peels, or rose petals. Or you can use the Author's Intelligent Pest Management ® (IPM) approach that combines several of the methods described below.

Trees heavily infested every year require carefully timed sprays of diluted Safe Solutions Tweetmint Enzyme Cleaners with Peppermint. **Codling moth life cycle:** Mature larvae overwinter under the bark in cocoons and pupate in spring. Adult moths emerge in mid-March to April and mate after the sunset temperatures exceed 62°F. Tiny disc-shaped eggs are laid on fruit or leaves. Hatching larvae immediately bore into the fruit. Larvae feed within fruit until mature then drop to the ground to pupate in soil or debris or under tree bark. **Reduce codling moths with sanitation practices**. Promptly remove any/all infested fruit from trees. Look for worm entry points ("stings") marked by tiny mounds of reddish-brown frass. Rake up and destroy all dropped fruit as soon as it falls, especially in May and June. Bagging protects fruit without using any chemical sprays, even when infestations are severe. Bag when fruit is 1⁄2 to 1 inch in diameter, four to six weeks after bloom. Cut a 2-inch slit in the bottom of a standard lunch bag, thin fruit to one per cluster, slip the fruit through the slit, and staple the bag shut. Remove bags just as fruit begins ripening. Use insecticide POISONS only when infestations are severe. Codling moth granulosis virus (sold as Cyd-X) is a safe biological pesticide that won't harm beneficials or bees. Add 1% horticultural oil to increase effectiveness. Apply every seven days after eggs hatch, at least three or four times per generation. **The Author prefers to use the simplest and most effective control - a solution of (1 oz. per 2 quarts) Safe Solutions Tweetmint Enzyme Cleaner and water.**

Make a bait using 1 cup of vinegar, 1/3 cup of dark molasses, 1/8 tsp. of

ammonia and 4 2/3 cups of water and cut off the base of a plastic milk container. Mix together the ingredients and pour the mixture into the base of the milk container. Fill it to a depth of 3". Hang the trap in the tree. This trap will be most effective if you hang 2 to 3 traps per tree. Empty periodically and refill with new solution. You can also take some corrugated cardboard and wrap several layers of the cardboard around the trunk of the tree in early spring. The larvae are attracted to the "homes" available in the corrugations of the cardboard. **Then simply remember to remove the cardboard in the summer and burn your trapped pests.**

Combining several nonchemical methods is the most environmentally sound approach. Make sure that your Safe Solutions Tweetmint Enzyme with Peppermint sprays are precisely timed to kill caterpillars just as they hatch. Hang a pheromone trap in your tree in March, and check it every few days for moths. Once you find moths and once sunset temperatures exceed 62°F, start calculating degree-days following the instructions in *Pest Notes: Codling Moth*. Degree-days will help you determine when eggs will hatch or when to start looking for "stings" on fruit that indicate larvae have hatched and are entering fruit. Start spraying Safe Solutions enzyme cleaners as soon as degree-day calculations indicate eggs are hatching (250-300 degree-days after moths are caught in traps) or as soon as you see stings. Use new stings or degree-day calculations to initiate sprays for second and third generations.

To summarize on how to keep those "worms" out of your apples and pears. Control them by interrupting their life cycle at various points. The egg hatches somewhere on a tree's leaf or fruit, then the larva enters the fruit and grows. It exits the fruit to pupate in a cocoon on the ground, or in loose bark on the tree. Adult codling moths emerge to mate and lay eggs. Stop the egg laying by spraying Tweetmint at the proper time. You can also use codling moth pheromone traps to capture male moths before they can mate. Set the traps at bloom time, and hang them in the top third of your tree canopy (1 or 2 traps for a small tree, and 2 to 4 traps for a large tree). Some avid males are bound to have mated before they find the trap. **Depending on your climate, there can be several generations of codling moths each growing season. R**eplace the lures every 8 weeks, until you harvest your fruit and walnuts. The eggs hatch during certain temperatures. Stop the larvae from getting inside the fruit A physical barrier will keep most of the larvae out of the fruit. One maggot barrier looks like a small nylon stocking that can cover each fruit (the barrier expands as the fruit grows). Stop the larvae from pupating over the winter. Once a larva climbs out of the fruit it will find a sheltered spot in loose bark on the tree, or in litter on

the ground, and build a cocoon. Capture the larva (now a caterpillar) as it descends, looking for a place to pupate, when you wrap Tanglefoot Sticky Tree Bands all around the trunks. **In the spring - check fruit for entrance holes and discard any affected fruit; pick up and discard fallen fruit. In the fall - remove dead fruit from the tree; rake up and discard fruit and leaves. There also is a kaolin clay powder that acts as a surface barrier on all parts of the tree.**

CRICKETS

In the Walt Disney film Mulan, Cri-kee the cricket is considered to be a good luck charm for Mulan's family. This idea is based on the traditional Chinese custom of keeping crickets in cages in the home for luck. Many Native American tribes also thought that crickets brought good luck, and the belief holds true for many Americans today, who believe that it is bad luck to kill a cricket in the house or harm any cricket needlessly. Despite these beliefs, the incessant chirping of a cricket in your home can quickly become quite annoying, especially when it only goes quiet when the search for it begins. In fact, that was one of the very reasons that the Chinese kept crickets in their homes - because the insects stopped chirping at a person's approach, the sudden silence gave an alert that someone had entered.

A cricket or two in the home will rarely cause any damage, but high populations can be of concern because of their tendency to chew. Now, if harming or killing the cricket(s) does not concern you, place glue boards (or duct tape upside down) in the areas of the room where any cricket chirping is heard. Use a little corn meal in the center of the board/tape as bait, and the cricket should be captured within a day or two. If the cricket can be found, it can also be simply vacuumed up. The vacuum should then be emptied or bag thrown away outside the home. If a heavy infestation has developed, either lightly dust with Safe Solutions food-grade diatomaceous earth or spray of clean with Safe Solutions Tweetmint Enzyme cleaner with Peppermint.

Crickets can only enter your home if you left them a point of entry, and they can only survive if conditions allow. If you want to prevent infestations: Caulk or otherwise seal all potential entry points, such as cracks in the foundation, and gaps around doors and low windows. Keep the foundation and immediate perimeter of your home free of grass, weeds, and mulch. Never store firewood or other organic material or debris near your home. Reduce harborage by setting trash cans up on bricks. Use yellow sodium-vapor lighting outdoors rather than white or mercury vapor lights. When possible, place lights on poles with the lighting directed toward the door or area(s) you wish to light. (This will draw insects to the light source rather than to your opening door.) Inside the home, reduce clutter, piles, etc. to reduce potential harborage and hiding areas and routinely clean with Safe Solutions Tweetmint Enzyme cleaner with Peppermint.

So, the first step in cricket control is to limit areas where crickets gain

access to buildings from the outside. Do this through exclusion, sanitation, and habitat modification: **Caulk or repair** cracks and gaps that are found in the foundation, around doors, ground-level windows, or other areas that crickets could use to enter indoors. **Cut** weeds and tall grass growing near the home's foundation. This provides crickets an unfavorable environment, giving them less chance to enter buildings. **Remove** firewood, brush, bricks, and other objects or debris close to the house. Set garbage cans on wood blocks. This reduces the number of harborage areas available to crickets giving them less opportunity to enter buildings. **Reduce** outside lighting to avoid attracting field crickets and house crickets. Turn off all unnecessary lights at night or use less attractive yellow lights instead of white, neon, or mercury vapor lights**.** Remove feeding and breeding sites outside. Garbage and other refuse that serves as food should be stored in containers with tight lids and elevated off the ground on platforms or bricks.

Cricket infestations are usually seasonal. Most often problems occur during the fall as evenings become cooler and the insects seek to enter your building for warmth and shelter. Because of this, occasional vacuuming or applications of diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint or baits containing 3% - 5% borax, food-grade DE or duct tape (placed sticky-side up) are all that is usually needed indoors for adequate cricket control. Crickets require a steady supply of fresh water and will drown easily in a shallow dish with a few pieces of dry dog food put in a shot glass in the middle of the saucer. Grasshoppers can be controlled outside with semaspore baits which spread an infection from which they cannot recover. You can make your own bait with corn meal and (1% - 5%) sodium borate or borax or food-grade DE. Try spraying diluted borax or lightly dusting food-grade DE directly on the problem area/bait/pest. Be careful not to contaminate anything (especially plants) with borax. Remember that we have quickly and safely and virtually instantly controlled crickets in the lab and field simply by spraying them with 1 oz. per quart of water Safe Solutions, Inc. Enzyme Cleaner with Peppermint. You can also steam clean/kill them. **Routinely mow your yard.**

A thorough inspection should be made and all observations properly recorded first. Correctly identify the species. Note all in infestations and conditions and conditions conducive. Vacuum up any invaders inside or outside. Cricket control begins outdoors with the reduction or elimination of moist harborage near the structure, such as removal of bricks, firewood, stone, lumber, wood piles and other debris. Routinely mow your yard and keep all of your

shrubs and gardens free of weeds and organic debris. Tightly seal and routinely clean garbage cans with Safe Solutions, Inc. Enzyme Cleaner with Peppermint and borax; stand them on bricks or blocks (off the ground). Repair all leaking plumbing and moisture problems inside and outside your building. Crawl spaces should be well ventilated and dry; the installation of a dehumidifier and/or a poly/vapor barrier and vents will help. Seal all entry points such as door thresholds by installing doorsweeps; caulk or seal or screen holes in masonry, around pipes, wires, facia, soffits, vents, trims, windows and doors and all visible cracks and crevices outside and inside. Eliminate all leaking plumbing, route downspouts away from the foundation. Lightly dust with talcum or medicated body powder or finely ground calcium chloride or food-grade DE. Maintain proper grade drainage, install vapor barriers in crawls and install air conditioning dehumidifiers and/or fans.

Some crickets, e.g., field and house and sometimes ground crickets, are attracted to lights...so shut them off or change outdoor lighting to less attractive sodium vapor lamps or yellow bulbs. Place glue boards in and around entrances. Use 5% food-grade DE or borax and molasses baits, but try baking soda, Comet®, talcum powder or medicated body powder first. Remember, crickets can be found anywhere, especially where food, clothes, linens and books are stored and it is especially vital not to contaminate these items with any toxic poisons. It is far better to take the time to use silicone caulk, patching plaster, mortar, cement, foam insulation, etc. to permanently seal all cracks, crevices and other openings; to use a hammer and nails or screw driver and screws to permanently tighten all siding, trim, molding, framing, etc.; plumbing tools to correct all leaks and to clean up and permanently remove all cricket populations, harborages, food and moisture sources than to poison even one person...besides, you have to do this maintenance eventually anyway! Routinely clean or simply spray infested areas with Safe Solutions, Inc. Enzyme Cleaner with Peppermint (1 oz. per quart of water), or a steam cleaner and/or borax (½ cup per gallon of water).

Spray crickets with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per quart of water) and they will die quickly. You can make your own baits using any food source the crickets seem to prefer, but these baits must be placed only where people, pets and/or wildlife can not reach them. Try corn meal sprayed or mixed with a water solution containing 1% - 5% borax or lightly dusted with food-grade DE and place in out of the way areas - away from people, pets and wildlife. Sprinkle baking soda, Comet®, talcum or medicated body powder or in infested areas- vacuum everything up when control

is accomplished. Diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint at a rate of 1 oz. per quart of water kills 100% of the crickets in about 10 seconds. Dish soap at 1 oz. per quart of water kills them all in 35 seconds. Vinegar in water (at 4 oz. per quart) kills crickets in about a minute. Salt water will kill about 50% in about a minute. Lemon juice in water (4 oz. per quart) will kill about 80% in about a minute.

CROWN OR ROOT ROT

Any factor which increases plant stress will usually increase root and crown rot. Control of root and crown rot is entirely based on prevention. There are no curative treatments. Pick a well-adapted variety with good winter hardiness and good disease resistance. It is important to pick a variety with resistance to Phytophthora root rot, resistance to bacterial wilt, Fusarium wilt, and anthracnose is also important. Information on variety reactions to disease is available at County Extension offices. Root/crown rot is a general term that describes any disease of woody ornamentals where the pathogen (causal organism) attacks and leads to the deterioration of a plant's root system and/or lower trunk or branches near the soil line. Root rots can be chronic diseases or, more commonly, are acute and can lead to the death of the plant. Gardeners often become aware of a root/crown rot when they see above ground symptoms of the diseases. Affected plants are often slow-growing or stunted and may show signs of wilting. Often the canopy of an affected tree or shrub is thin, with foliage that is yellow or red, suggesting a nutrient deficiency. Careful examination of the roots/crowns of these plants reveals tissue that is soft and brown. Several soil-borne fungi can cause root/crown rots, including (most frequently) *Phytophthora spp., Pythium spp., Rhizoctonia solani, and Fusarium spp*. These fungi have wide host ranges, and prefer wet soil conditions. Some root rot fungi such as Pythium and Phytophtora produce spores that can survive for long periods in soil. **How do you stop root/crown rot? REDUCE SOIL MOISTURE!** Provide enough water to fulfill a plant's growth needs and prevent drought stress, but DO NOT over-water. Remove excess mulch (greater than four inches) that can lead to overly wet soils.

Buy plants from a reputable source and make sure they are root/crown rot-free prior to purchase. Establish healthy plants in a well-drained site, and when planting, place the root collar just at the soil surface. Properly moderate soil moisture. Add organic material (e.g., leaf litter or compost) to heavy soils to increase soil drainage and **DO NOT over-water. Also, DO NOT apply more than three inches of mulch around trees and shrubs, and keep mulch from directly contacting the base of trunks and stems.** Prevent physical damage (e.g., lawnmower injury) that can provide entry points for root/crown rot pathogens. Finally, minimize movement of root/crown rot fungi in your garden. DO NOT move soil or plants from areas where plants are having root/crown rot problems. **DO NOT water plants with water contaminated with soil (and thus potentially with root/crown rot fungi). After working**

with plants with root/crown rot, disinfest tools and footwear with a 10% bleach solution, a detergent solution, or alcohol or Safe Solutions Tweetmint Enzyme Cleaner with Peppermint.

When well-watered trees or other plants start to wilt, one cause may be root or crown rot caused by Phytophthora. Almost all fruit and nut trees and most ornamental trees and shrubs can develop root or crown rot if the soil around the plant remains moist for prolonged periods. Tomatoes, peppers, eggplant, and other vegetable crops also can be affected. **The most important way to prevent Phytophthora root and crown rot is proper irrigation.** Leaves appear water-stressed but don't respond to irrigation. Leaves may turn dull green, yellow, red, or purplish and may wilt. Often only plants in the most poorly drained areas are affected. Unlike plants suffering from water stress, plants don't recover when irrigated. Darkened areas in the bark around the crown and upper roots may develop, sometimes with gumming. Reddish-brown streaks or zones may be apparent in the inner bark and outer layer of wood. In tomatoes and eggplants, roots develop water-soaked spots that turn brown, and roots may be rotted off. If mushrooms are present or filamental growth is visible within plants, damage is likely due to a fungal disease such as Armillaria root rot, not Phytophthora. **Water management is key to preventing rot**. Avoid prolonged soil saturation or standing water around tree bases. Adjust sprinkler heads and drip systems, so water doesn't hit trunks. Provide good soil drainage. Raised beds can be a good solution for vegetables where drainage is a problem. Group plants according to irrigation needs and water accordingly. Avoid salinity and water stress between irrigations. Take steps to avoid problems when you plant. Don't plant trees or other plants deeper than they were planted in the nursery. Never cover the graft union with soil or mulch. Select certified nursery stock and resistant rootstocks or varieties when available. Don't maintain irrigated turf around the base of trees. **If Phytophthora has been a problem on tomatoes, rotate that area into a non-susceptible crop such as sweet corn for a year or two**. Trees can sometimes be saved if caught in early stages. At the first sign of leaf wilting, examine the tree at the soil line for rot. Cut away any bark that looks affected. Remove soil from around the base of the tree down to the top of the main roots, and allow the crown tissue to dry out**. Keep water away from the crown and trunk. Young trees may die rapidly; older trees may survive for several years**.

DAMPING OFF DISEASE

Damping off (or damping-off) is a horticultural disease or condition, caused by a number of different pathogens that kill or weaken seeds or seedlings before or after they germinate. **It is most prevalent in wet and cool conditions.** Seeds may rot before they germinate, shoots may decay before they emerge, or stems of seedlings may rot at the soil line. Damping-off is most common when conditions are wet and cool and soil is compacted. **Manage damping-off disease by planting at the right time, germinating seeds indoors in disease-free soils, and following planting practices that reduce risk of the disease. Plant when temperatures are favorable for rapid seedling growth. Don't plant seeds or transplants into cold, wet soil.** If you want to start plants earlier, plant seeds indoors and transplant later. Shallow planting will speed up germination outdoors if conditions are marginal. If planting potato seed pieces, be sure soil is at least 50°F. **Reduce waterlogging in planting beds by improving drainage. Use raised beds**. Add soil amendments such as redwood shavings, peat moss, or bark. Avoid using unfinished or green compost, which holds water and promotes disease development. Apply good cultural practices for seedling plants**. Don't overwater**. Thin plants after they emerge to improve air circulation. **Don't over-fertilize with nitrogen**. **Avoid planting the same crops in the same place year after year.** Employ good sanitation practices. Use clean pots. Remove and discard diseased plants. For plants grown in pots or cold frames, use steam-treated soil or pasteurized potting mix. Outdoors, consider solarizing soil before planting, a method that uses the sun's heat and clear plastic to kill soil-borne pests. Use the highest quality seed available. Damping off can be prevented or controlled in several different ways. Sowing seeds in a sterilized growing medium can be effective, although fungal spores may still be introduced to the medium, either on the seeds themselves or after sowing (in water or on the wind). Maintaining drier conditions with better air circulation helps prevent the spread of the disease, although it can also prevent or slow down germination. Spraying or drenching the soil with a recommended anti-fungal treatment helps suppress the disease.

Somewhere lurking in the air in your home is the fungus spores of the most dreaded Damping Off Disease that is fatal to your young seedlings. Damping Off Disease also occurs outdoors, too. We are less likely to recognize it outdoors, as the loss of plants in the spring can be attributed many of things. Damping Off disease thrives in cool or cold, dark or cloudy, wet or damp

conditions. The disease is airborne, and the fungal spores take root in your soil and quickly spreads across the seed tray, jumping to other trays with ease. It is fatal to young seedlings, nipping them off at the soil level. Treatment: As with other plants diseases, prevention is the best means of treatment. If Damping Off disease does take hold in your seed trays, act immediately. Remove diseased sections to minimize the spread. If it has affected a significant number of plants, replant them all in new soil and clean containers. Do not reuse the soil and use new containers. Controlling the disease is a matter of removing the environment that Damping Off disease thrives in**.** Buy sterilized seed starting soil. Use clean, sterilized containers. Provide plenty of air circulation. Tip: Use a small fan and direct a gentle breeze across the room. The important word here is "gentle". Thin your seedlings to increase air circulation. Provide as much sunlight as possible. Let the surface of the soil dry out between watering. Watering from the bottom is preferred. Stir the top of the soil around the seedlings. Put your seedling plants in a sunny location. Don't leave your seedling trays in the basement. Basements are perfect breeding grounds. Don't overwater your plants. Do not use fertilizer on your new seedlings. Don't use tray covers. While it is a popular practice to use them, they increase the humidity level and encourage disease growth. Nitrogen in your fertilizer can promote rapid growth of Damping Off Disease. Try **soaking seeds in a small amount of water and a clove of crushed garlic to try to prevent the disease. Try misting the plant with Chamomile tea as a** preventative or placing a little fireplace ash on the top of the soil. **Safe Solutions Tweetmint Enzyme Cleaner with peppermint or cinnamon or garlic will also acts as a “fungisafe”.**

DEER

Deer are probably the most widely distributed and best-recognized large mammals in North America. The white-tailed deer (*Odocoileus virginianus*) is found throughout much of North America. The mule deer (*O. hemionus*)is primarily a western species restricted to buttes, draws, and stream bottoms with sufficient forage. The black-tailed deer (*O.h. columbianus*) is a subspecies of the mule deer. Both white-tailed and mule deer are very important game animals. In 1974 about 2 million white-tailed deer were harvested by over 8 million hunters. The trend in both harvest and hunter numbers has been generally upward since then. The positive economic value of deer through license fees, meat, and hunter expenditures for equipment, food, and transportation can be measured in hundreds of millions of dollars. Hesselton and Hesselton (1982) estimated the value of each deer harvested in the United States to be worth $1,250. **With the additional aesthetic value of deer to landowners and vacationers, the economic importance of deer as a wildlife resource cannot be disputed**.

Although pleasant to look at in the wild, deer can be very destructive in your garden, orchard, and/or landscaped areas, feeding upon a wide variety of plants, they can severely damage crops and personal property, and they harbor diseases and parasites common to humans and livestock. Unlike moles, rats, and other species implicated in damage, deer cannot be casually eliminated when they are found to be in conflict with humans. But neither can landowners be expected to bear the entire burden of support for this valuable public resource. These factors often make deer damage control a difficult social and political problem as well as a biological and logistical one. Control methods are built around effective deer herd management. Thus the various state wildlife agencies are often indirectly or directly involved through subsidy of control techniques, direct damage compensation payments, or technical advice. Scare devices, repellents, and shooting all have a place in deer damage control. Effective control for fields, orchards, and other large areas, however, usually depends on excluding the deer with one of several types of fences. **Toxicants, fumigants, snares and in most cases, trapping, are not used in deer control.**

Repelling and excluding deer with fences dogs or plant protectors provides the best long-term control. Deer often feed late in the evening and very early in the morning, so you won’t always see them during the rest of the day. They are a special problem in gardens next to woodlands that can provide them harborage during the day. Deer eat shrubs, vines, fruit and nut trees, garden vegetables,

grasses, and small flowering plants. But, before you blame "Bambi" make sure the deer caused the damage, look for these signs to confirm deer damage: Hoofprints, 2 to 3 inches long, split in the middle, pointed at the front, and more rounded at the rear. Piles of small jellybean-shaped manure droppings. Trampled plants and shredded or ragged foliage, buds, or terminals. Girdled trunks or branches broken by deer rubbing against them with their antlers.

Be aware of legal restrictions. Most States classify deer as game animals. If deer are damaging your property or crops, you must get a permit to legally shoot them; shooting, however, isn't recommended around homes and gardens. **All traps, snares and poisons are illegal and can't be used.** Protect your garden with fences. A properly built and maintained fence 7 or 8 feet high is the most effective control method. Fence height may need to be extended for steep slopes. Most existing fences can be made deer-proof by extending them 3 or 4 feet with mesh or smooth wire. Be sure the fence is sturdy and fitted to the ground, so deer can't crawl under it. Use wire or plastic plant protectors to shield individual plants. Standard electric fences haven't proven very effective. The New Zealand type fence may be effective but should be professionally installed and constantly monitored. **The Author prefers to use a silent dog "fence" and a few patrol dogs**.

Chemical repellents that give off foul tastes or odors, such as the scent of a predator, can be useful in some situations. Repellents must be reapplied at frequent intervals, depending on what is used and the weather. Repellents may not work if preferred food sources for deer are available or they are very hungry. Many repellents aren't allowed on food crops or can damage some plants. **Read the product label**. Deer quickly adjust to most noisemaking devices such as propane cannons and electronic alarms, making them ineffective. However, new devices featuring deer distress sounds show some promise. Consider deer-resistant plants. There are plant species deer don't prefer to eat, especially when other more palatable plants are available. However, when food is scarce, deer will ignore repellants and will eat most plants including many deer-resistant species. Consult your local nursery and garden center, or refer to gardening publications about deer-resistant plants suitable for your area.

Deer are selective feeders - whether a plant is eaten depends on season, plant palatability, and availability of alternative foods, weather conditions and nutritional needs. The hungrier they are the less selective they are; no plant species will be totally avoided by deer under all conditions. Deer learn quickly and learned behaviors are taught to their young. Deer have learned that suburban homeowners are not a threat and often won't run unless actually

chased, so gardeners have to be more resourceful. Place some soap shavings or used cat litter along the ground to create a boundary between their grazing area and your garden. Also try hanging a salt lick in their path to distract them from your plants. **Deer will learn the limit of a tied dog and stay beyond that range, then help themselves to your plantings.** Once deer establish a pattern of behavior it is very hard to break. Deer are creatures of habit, and will continue to return to a successfully forged area. **Therefore if you have had deer damage in the past it is very important to use a proper control method BEFORE you see deer damages. Preventing deer damage before it starts is easier than interrupting an established pattern. Once they adapt to your garden, they will adopt it**. Damage reduction should include different strategies in different times of the year; stronger measures are needed in late winter and early spring because their natural foods may be scarce.

The Author prefers the use of dogs confined to the area by invisible "fencing" - the basic concept is simple. A wire is buried 6–12 inches deep along the field perimeter that produces a signal detected by a special dog collar. As the dog approaches the wire, an audible tone warns the dog that the next few steps toward the wire will bring a blast of electricity to its neck. Initially, small flags are placed above the buried wire allowing the dogs to learn the perimeter without having to receive a shock at every point. Gradually, after several renditions of removing every other flag, the flags will all have been completely removed and the dogs will have learned the limits of the field, and the "fence" will have become truly invisible. This is simply a scaled up version of the Invisible Fence system used by homeowners to keep their pets in their yard. Most any dog will work as long as it can get around the fields well. The dogs really do not chase the deer to any great extent. Their role is to simply "mark up" the field/orchard/nursery/grove providing a scent deterrent for the deer. To be effective, two dogs can usually service 30–40 acres. Several factors such as deer pressure, topography, and crops grown will determine how many acres a pair of dogs can actually provide protection for. The cost of installation will vary, but $100–$125 per acre protected is about average. This includes labor, materials, dog acquisition and dog training.

DUST MITES

The term "house dust mites" has been applied to a large number of sightless, eight-legged, microscopic arachnids called mites (smaller than a speck of salt) found in dwellings associated with dust. About 80% of dust in a building is us; each one of us sheds several million cells daily or about the weight of a paper clip. A family of four could fill a quart container in a month! Dust mites breathe through their skin and have a hypopial stage that makes them virtually immune to synthetic insecticide poisons and fumigants during this deep dormancy stage of life. They love warm, humid settings and feed on skin scales and dander shed by humans and animals. Hundreds can be found in one pinch of dust. Household dust is a microscopic blend of sloughed skin cells, sneezed viruses, soil, furniture and clothing fibers, pet dander, carpeting pieces, soil, mold, bacteria, insect fragments, etc. The average U. S. home collects 40 pounds of dust per year, which is home to at least 15 species of mites that live about 45 days and one ounce can contain over 42,000 individuals.

ECONOMIC IMPORTANCE: 35 million people in the U. S. suffer from dust mite allergy symptoms. In England, 1/3 of all cereal foods inspected had dust mite contaminations. Because of the medical implications, house dust and the fauna of mites associated with house dust have been tested for the source of the house dust allergen. The highest house dust allergen activity was found in dust samples stored at 85% RH. Mite allergens are mainly present in feces of house dust mites and may become airborne and inhaled by patients giving rise to asthma, rhinitis, or atopic dermatitis. Mite cultures contain so much allergen that a millionth of one per cent is still reactive to allergic people per Judith A. Mollet of Virginia Tech. This is suburbia's most common allergen. The second most common allergen is the pet cat whose dander, hair and saliva are all allergens. In the Northeast the cockroach is the most important allergen. Even the most spotless buildings house millions of dust mites. It is estimated that humans shed about 400,000 particles of skin a minute!

DISTRIBUTION: Nearly cosmopolitan, associated with house dust, bedding, carpets, furniture and bird nests.

HOSTS: Mammals, particularly man, and in bird nests and occasionally in bee hives**.**

DESCRIPTION: A sightless, microscopic (1/100 of an inch long) creature that lives in carpeting, drapes, bedding, upholstered furniture and stuffed

toys. They prefer temperatures in the 68º - 84º F. range. Both male and female adult house dust mites are globular in shape, creamy white and have a striated cuticle. The female measures approximately 420 microns in length and 320 microns in width. The male is approximately 420 microns long and 245 microns wide. (About the size of a sharp pencil dot. They look like miniature hairy dinosaurs, complete with armor plates and pincers.) Adults are about 1/100" to 1/64" long with soft, oval, somewhat flattened bodies. They are very dependent on temperature, moisture and an adequate food supply. While these microscopic mites, which are relatives of spiders that feed on our dead (moldy) skin, are found in the United States, they are much more prevalent in England where humidity is very high (over 50%), so use a dehumidifier and a fan with an activated charcoal filter. You provide their food in the form of dead skin cells that fall off your body each day. As Heywood Banks, the singing comedian, has written in a song, "Those dust mites smack their bony lips and eat that skin like taco chips. It's a rain of manna from the sky." **Dust mites are easily controlled when they are exposed to direct sunlight so hang your wash out on a clothesline or steam clean all items.**

House dust mites often cause allergic reactions. Dust mite feces contain at least 15 proteins that act as allergens. These mites and/or their droppings may cause allergic reactions to 500 million people worldwide and be responsible for triggering reactions in 50% to 80% of asthmatics! The University of Virginia estimates hospital emergency rooms see over 200,000 asthmatics a year with allergic reactions to dust mites. Female house dust mites can deposit 50 eggs in her 36 day (average) life span. Each mite can deposit 20 fecal pellets a day. So you can see how they can totally overwhelm your area very quickly with allergens that are normally "recycled" every time you vacuum or dust**. For more information call 1-800-7-ASTHMA FREE 1-800-422-DUST FREE..**

DUST MITE SPECIES: There are several species worldwide including the House Dust Mite, *Euroglyphus maynei*, the American House Dust Mite, *Dermatophagoides farinae* (Hughes) and the European House Dust Mite *Dermatophagoides pteronyssinus* (Trouessart). Cast skins, fluids, feces and body parts of house dust mites accumulate with other dust and small household allergenic disintegrated matter. Vacuum with a Hepa filter intensely. A new and effective control method is to spray carpet with tannic acid solutions obtained from carpet cleaning suppliers. We prefer that you mop and routinely clean/dust and/or use a rinse-and-vac with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint.

LIFE STAGES AND BIOLOGY: The life cycle of 2 mite species *D. farinae* (Hughes) and *D. pteronyssinus* (Trouessart) include egg, active larvae, resting larva (*Pharate tritonymph*), active tritonymph, resting tritonymph (pharate adult), and active adult. Between 19-30 days are needed to complete a life cycle depending upon the temperature and humidity (Furumizo, 1973). Mated females live about 2 months. A male may attach itself to a tritonymph female and mate when she reaches the adult stage. *D. farinae* lays eggs over a 30-day period, producing about an egg a day, while *D. pteronyssinus* lays about 80 eggs over a 45 day period. There is a general agreement that house mites in the home feed on shed skin of man. The average individual sheds 0.5 to 1.0 gram of skin daily. Each dust mite can excrete 20 fecal pellets in a day, or an amount of excrement equal to 200 times its own weight in a lifetime. Spieksma et al. (1971) reported that the mites were very sensitive to relative humidity and at 60% or lower the mite population stops growing and dies out, so install a dehumidifier and fans. Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint will control not only the dust mites but the fungus *Aspergillus repens* which predigests human skin flakes into a form the mites can eat.

Non-Toxic Control:

Reduce the relative humidity with properly installed dehumidifiers, fans and/or air conditioners. Routinely remove (if possible) any dander, dead skin and/or dust and/or dust catching materials, e.g., books, magazines, clutter, stuffed animals, rugs, textiles, furs, feathers, woolens, drapes, carpets, etc. and/or enclose mattresses, pillows, and box springs in plastic and clean and/or wash or spray all surfaces and air filters with Safe Solutions, Inc. Enzyme Cleaner with Peppermint as needed. Install allergen trapping filters in air conditioning/heating systems. Keep all clothing in closets with the doors closed. Keep windows closed in the spring. Clean the air with HEPA air filtration**.**

Avoid sleeping with or keeping pets - especially cats and dogs or wash often with 1 - 2 oz. of Safe Solutions, Inc. Enzyme Cleaner with Peppermint. It is best to keep your pets outside; if you can not – use a HEPA vacuum daily and wash your hands after petting your pet. Dander stays around long after the pet has gone.

Keep windows and doors closed and as weather-tight as much as possible to avoid the entry of pollen and insects. Clean window coverings every two weeks or replace with shades or mini-blinds.

Keep food products in glass containers and control all insect pests.

Reduce the relative humidity below 50%; repair all plumbing/moisture problems; install a dehumidifier and/or air filtration system. Hot air vents should be covered with HEPA filters**.**

Avoid wet mopping and dusting unless you use diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per gallon of water). Then use Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint in a rinse-and-vac or spray diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint, but vacuum very thoroughly with a rinse-and-vac, vacuum with a HEPA filter at least once a week - go very slowly and allow the vacuum to actually suck up all materials; dust furniture and shelves before you vacuum. Carefully and slowly vacuum beds, pillows, drapes, carpet, upholstered furniture, floors etc. **Steam clean everything. Don't allow smoking in the building.**

Shampoo or steam clean or dry clean (off premises and air out thoroughly before returning) or better yet, simply put in to the sun all non-washable carpets at least once a year.

Weekly washing sheets, pillows, rugs and carpets in soapy water or borax at least 122º F. for 5 - 8 minutes will kill all mites.

Direct sunlight also kills mites and bedding is the prime harborage for dust mites, with stuffed furniture a close second. So put furniture, bedding, drapes, clothing, etc. out in the sun and/or line dry your washing. Replace heavy drapes with washable shades, mini-blinds or lightweight curtains.

Put plush toys in a plastic bag, tie the bag and freeze for 24 hours. Repeat as needed, e.g.. once a week or wash them weekly. It is best to only purchase washable stuffed toys and wash them weekly with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint in water (100º - 120º F.).

To control dust and dust mite allergens take a (square box) window fan, using duct tape attach one (charcoal) furnace filters (cut to size) to the fan grill only on the intake side. Turn on the fan to filter the air. Activated charcoal will increase the filtration results and help remove odors and some toxic gases. Change filters as needed. You can also use a high-efficiency HEPA air cleaner.

Over 25% of an old pillow might be dust and dust mites - so get a new one every 6 months. Remove carpeting, rugs, stuffed animal toys and drapes if needed.

Least-toxic Control:

Routinely steam clean and/or mop and clean with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint or alcohol. Then, if you still have any allergic reactions, as a last resort, you may have to try to clean with borax (½ cup per gallon of hot water). Houses severely infested with dust mites might require more cleaning with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or borax to reduce mite allergens to tolerable levels (less than two micrograms of allergen per gram of dust).

Clean any mold in the basement, bathrooms, kitchen, etc. with diluted bleach or borax or, better yet, with 2 oz. of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint per gallon of water.

MORE METHODS TO MANAGE DUST MITE ALLERGIES - Caution: Children's bedrooms may be hazardous to their health. Kids occupy them a third or more of each day, and while there, come in close, long-term contact with bedding, carpeting and other fibers. While these furnishings can be comforting touches, they also contain most allergy sufferers' biggest enemies: dust mites. Microscopic arachnids, these 8-legged spider-like scavengers thrive in humid and warm conditions, shedding particles that trigger symptoms even after the insects cease to exist. Remove the fuzzies - wool blankets and non-washable stuffed toys. Install medical-grade air cleaners, use dustless vacuums and obtain other less costly aids that keep allergies at bay. Humans shed about 1/5 oz. on dead skin (dander) every week. About 80% of the "dust" seen "floating" in a sunbeam is actually shed skin flakes. **Dust mites can only eat dead skin flakes (both animal and human) that have fungus growing on them. Safe Solutions, Inc. Enzyme Cleaner with Peppermint (1 - 2 oz.) and/or borax (½ cup) per gallon of water kill the fungus and eliminate their food source and will also kill the dust mites.**

The first hurdle to overcome: The bed. That's because a mattress is the resort capital of the dust mite's world. A double bed mattress can hold millions and millions of mites; you feed them with you and your provide them with about 1 pint of moisture vapor each night through your breathing and perspiration. Pillows and blankets are popular too. Mattresses and box springs should be encased in zippered, dust-proof covers. Sleep movement (people toss and turn up to 60 times each night) kicks up allergens, which are then breathed in and/or can remain suspended in the air for up to 24 hours. Washing bed linens in hot water is crucial. Water below 120° F. prevents accidental scalding, but it must be 130° F. or you must use borax and/or Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint in cooler water to kill dust mites. For hotter water without

scalds, get an "instant flow" device that supplies hot water at a specific point of use, such as a washer. Because bunks, canopies and upholstered headboards attract dust, avoid them, and don't allow a bed to be placed on the floor as it fosters dampness because bedding can't breathe, and dampness means moisture - an ideal condition for mites. Try leaving an electric blanket turned on high during the day to dry the humidity and kill the dust mites in the mattress. Wash blankets in hot water and borax every two weeks. Avoid blankets made of wool or down or routinely wash them in 2 oz. of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or 2 oz. of borax per gallon of water.

The next place to concentrate on is the floor. Mites claim it as their private stomping grounds too. The University of Virginia maintains that carpets are likely to have 100 times more allergens than wood floors. Besides hardwood, tile and vinyl are good flooring alternatives. You will still need to remove all traces of dust on them and on woodwork, however, by cleaning with water and Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint, then wax or oil regularly. Even using a damp cloth with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint or diluted alcohol every day helps. Small rugs and throws, if they are washable - and laundered often in borax - are all right. Low pile carpet usually is not as troublesome to an allergy sufferer as high shag. A vacuum with a high-efficiency particular air (HEPA) filter will capture particles without spewing exhaust dust, as a standard vacuum's paper filters does. A HEPA filter eliminates 99% of dust. There are chemical carpet products that reduce or destroy allergens - A moist powder is sold in all states but California. A tannic acid spray is acceptable there. A central or portable air purifier with a HEPA or electrostatic filter will remove particles and some dust mites - Keep in mind it is only effective on airborne irritants**.**

A refrigerated air conditioning system which, if ducts are professionally and routinely cleaned, can prevent hot and humid conditions that stimulate mite growth. Central heating ducts demand similar maintenance and synthetic filters to prevent dirt particles. Keep indoor relative humidity below 50% by using a dehumidifier, especially during humid seasons. Pets: Animal dander, saliva and other irritants, including dust that their fur collects, may cause allergic reactions, so keep them out of bedrooms or use an air filter.

Windows: Choose washable curtains or roller shades over draperies or blinds. When you clean, move all furniture to the center of the room so you can reach all of the corners and, with a damp cloth, wipe all of the moldings, light fixtures, shelves and door and window tops. Clean wood or linoleum floors daily

with a specially treated dust cloth and mop cover. Don't use dusters, dust mops. bag-equipped vacuum cleaners or brooms - these utensils merely rearrange the dust or provide breeding grounds for additional dust mite/allergen growth**.**

Medical-grade air filters circulate and effectively clean up to 300 cu. ft. of air per minute. Inexpensive table top models generally are ineffective. 30 drops of tea tree oil in your sprayer, washing machine or rinse-and-vac will help kill mold and dust mites. The distinct tea tree odor disappears when dry. Air out for 1 - 2 hours before re-entry. Repeat as needed. Metabolic gases emitted from molds and fungi growing inside buildings may be a significant source of volatile organic compounds (VOC's) that can cause indoor air quality problems known collectively as the "sick building syndrome". Spray, clean or wash with 1 o 2 oz. Safe Solutions, Inc. Enzyme Cleaner with Peppermint per gallon of water to kill mold, dust mites and remove allergens. Tape an activated charcoal filter on the back side of a window fan - turn on and filter mites/dust from the air. Change filters as needed. Install and properly maintain dehumidifiers and/or air conditioning. Lower the relative humidity below 50% and control this pest. **Remove all dust and dead skin routinely and thoroughly.**

Dust mites are an extremely common allergen. They are found all over the United States. They thrive in people’s homes, particularly in bedrooms and other frequently used rooms. You can find them in mattresses, carpets, drapes, upholstered furniture, towels, clothing and stuffed animals. Their waste product causes your allergy. **There are a variety of ways you can minimize your exposure to dust mites. By minimizing your exposure, you can significantly diminish your symptoms**. A growing body of scientific evidence, as well as patients' personal experiences, shows a strong link between indoor dust and illness, especially asthma and allergies. The most common culprits in household dust are dust mites, mold, mildew, fungi, algae, roaches and other insects, pollen, and animal dander. **Droppings from dust mites and cockroaches, as well as their body parts, contain powerful allergens.** Fine particles of these materials can become airborne as "dust" and can be drawn into the lungs, causing serious health problems. Mites thrive in dust and high humidity and live primarily in mattresses, carpets, and upholstered furniture. Typical furnaces are not designed to trap the fine particles and spores that cause health problems. However, an electrostatic precipitator, which offers high efficiency in removing small particles, can be installed in the return air duct near the home's furnace. The charging section gives particles a positive charge. Then the negatively charged collector holds on to the particles. Units have a removable dust-collecting plate that needs to be cleaned regularly. Pleated filters are much more

efficient than standard fibrous furnace filters; smaller ones do not require modification to the furnace or ductwork. But they are less efficient than electrostatic cleaners. **Pleated filters should be inspected regularly and may need more frequent replacement than conventional filters. Sunlight will kill dust mites but it will not get rid of the allergens.**

When dust mites have settled down into your rugs and floors, you run the risk every time you walk over them, of causing the dust mites to get airborne again where you inhale them. Better to vacuum them up with a good HEPA vacuum where they can no longer do you any harm. **Vapor Steam Cleaning is an extraordinary new way to deep clean and remove dirt and stains, and to kill dust mites, mold, germs, spores and bacteria.** Powerful steam cleaners with the right attachments can kill dust mites on any surface such as a carpet or bedding without the use of chemicals. When bed sheets are washed in either super hot (140 degrees Fahrenheit) water or in steam water, 100 percent of household dust mites are killed. Not bad. Hot cycles worked best with dog dander, too, as does an extra rinse cycle. **Studies have shown hot water is best for reducing pollen allergen as well**. Dust Mites have a tendency to get airborne and float around, and then you end up inhaling them causing your allergies to run riot. The solution is to trap them in a good quality HEPA air purifier without their food source [your skin flakes], then they just starve to death. Dehumidifiers are essential for reducing moisture levels in your home, which in turn inhibits mold growth and dust mite proliferation. Changing furnace filters regularly is part of the routine for preventing the recirculation of indoor pollutants such as dust mites. Since dust mites thrive in a moist environment, pillows made out of latex, wool or silk are good choices for someone wanting to control dust mites. These materials are proven to wick away moisture very quickly. Mattresses made out of latex, besides being unbelievably comfortable, are perfect for someone wanting to control dust mites. Latex wicks away moisture very quickly preventing dust mites which thrive in a moist environments. Dust mites feed off dead skin flakes and thrive in warm, moist environments like your bedding. A good dust mite encasing is usually the first thing that your doctor will recommend for allergy control. **The Author recommends routine cleaning with Safe Solutions Tweetmint Enzyme Cleaner with Peppermint**.

Removing Dust, Allergens, Odors and Dander - You can install expensive HEPA filters or you can get an inexpensive 20-inch box fan. The older models are better than newer models because the older models are quieter and move less air. Then you need to purchase the Allergen Filtrate 1000 furnace

filter by 3M in the red and white wrapper. Use masking tape and tape the filter making sure that you seal the filter's edges completely to the back of the fan, so all of your ambient air is pulled thru the filter - when you turn on the fan. If you attach the filter to the front of the fan very little air will pass through, and it also can put a bad load on the fan's motor. **Do not even think about putting one of these filters on both the front and back of the fan.** Run the fan on low 24 /7. Only the Filtrate 1000 works to visibly remove smoke odors. If you have cigarette smoke the 1000 filter rapidly turns grey, then coal black. Other Filtrate filters including the 700 model, or the 1200 ultra model stay white no matter how long you run the fan. The filter fan works better than putting the Filtrate furnace filter on your forced air furnace, because the window fan can be continuously run 24 hours, and moved from room to room. **A box fan runs cheaper than a furnace fan too. When you see how black the filter gets, it will make you sick to your stomach to see what could have been breathed into your lungs!**

EARWIGS

People used to think that earwigs would crawl into sleepers' ears and burrow into their brains to lay their eggs. After all, they're active at night and they have those impressive pincers. In fact, earwigs like to eat fruit, plants, decaying matter, and a few bugs. They escape the cold by burrowing deep in the ground or invading your house. **Earwigs are conspicuous and easily recognized relatives of cockroaches**. They are ¼ - 1" long, elongated, flattened insects with forceps or pinchers at the tail end; they may be winged or wingless. While their prominent tail-end pincers might look ferocious, earwigs aren't harmful to people. Earwigs can seriously damage seedling vegetables and chew holes in annual flowers, soft fruit, and corn silks, but earwigs also play a beneficial role by feeding on aphids and other insects. Nocturnal in habit, earwigs feed at night and hide during the day in dark, cool, moist places in the yard or within flowers or vegetables. To manage earwigs, reduce hiding places and moisture, and employ a vigilant trapping program. At first glance, winged earwigs appear to be wingless; in fact, their wings fold up many times under the small front wing covers; some fly to lights. Earwigs have chewing mouthparts and are opportunistic omnivores that feed on other insects and often scavenge in garbage and moist plant material. They also feed on some plant tissue, and at least one is a pest in greenhouses. They are dependent on high moisture. Earwigs are active at night; they shelter together and are quiet during the day, hiding in moist, shady locations. Their tarsi are 3 segmented

Earwig females tend their young. Like roaches, they are crack and crevice oriented. They place their eggs in moist depressions or holes, guard them, groom them until they hatch, and take care of the early stage nymphs. Earwigs grow with gradual/simple metamorphosis: older nymphs and adults harbor together - their gregarious behavior is (like the cockroach) the result of an aggregation pheromone.

Approximately 1,100 species of earwigs have been described worldwide. About 22 species occur in the U. S., but only a few are household pests. The common name of "earwig" comes from an old European superstition that these insects enter the ears of sleeping people and bore into the brain. The old Anglo-Saxon word earwig literally means "ear-creature". This belief is basically without foundation; only occasionally one will try to hide inside a human ear. Dermaptera refers to the "skin-like" forewings present in winged species, and the term forficulina translates into "little scissors." Antennae are thread-like and

about half the body length. The forceps-like abdominal cerci are apparently used as both offensive and/or defensive warnings or weapons, and are sometimes used to capture prey and to fold their wings after flight. As frightening as they look these pincers are not considered harmful to people. They are considered to be beneficial insects by many people because they are predators on some small insects, e.g., aphids, and they are primarily scavengers of dead animal or plant materials, although they do feed on and/or damage live plant materials. Populations generally build up around building foundations. If you must kill them simply spray the foundation with dish soap water and/or diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 - 2 oz. per gallon of water). **Properly install and use a dehumidifier and/or air conditioner and/or fans.**

Vacuum basement areas or elsewhere inside or outside to remove earwigs.

See the "inspection" traps. Add a little honey or peanut butter (and a little earwig frass), bury or place a shallow dish, bottle, jar, or an empty tuna/sardine can in the earth - so the "hole" is now at ground level - add or leave a little fish oil in your "trap" - in the early a.m. shake the contents of each "trap" into a bucket of soapy water. You can also make shallow traps with soapy or diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint.

Properly install a dehumidifier and fans to establish a low moisture zone around the building.

Prepare a band of vegetation-free (and bark/mulch-free) area around the building.

Caulk/seal all cracks and crevices in the foundation. Lightly dust with Comet® or talcum or medicated body powder or food-grade DE.

Sprays of detergents and/or dish soaps are known to quickly kill earwigs. Use pesticidal soaps when labeled for this use, or better still spray with diluted Safe solutions, Inc. Tweetmint Enzyme Cleaner with Pepper- mint (1 - 2 oz. per gallon of water).

Bait with 5% or less boric acid or food-grade DE in corn meal lightly coated with corn oil – do not forget to add a little earwig frass. **Keep all baits out of the roach of children, pets and wildlife.**

Earwigs will not cross a stripe of petroleum jelly or duct tape placed sticky-side up.

A tachnid fly parasite imported from Europe will greatly reduce earwig populations. Plant dill, parsley, sweet clover, fennel, buckwheat and herbs to

make these flies feel at home.

Leave a couple of cans (half full of beer) out overnight - tomorrow they may be full of earwigs.

Steam clean the infested area.

Reduce outdoor hiding places.

Trap earwigs with rolled newspaper, bamboo tubes, or short pieces of hose. Place these traps on the soil near plants just before dark, and shake accumulated earwigs out into a pail of soapy water in the morning. A low-sided can filled with oil and a drop of bacon grease or fish oil also makes a good trap. Daily trapping will quickly reduce earwig populations to tolerable levels.

Inside The Home

Earwigs might seek refuge indoors when conditions outside are too dry, hot, or cold. Large accumulations of earwigs can be annoying but present no health hazards. When earwigs invade your home follow these steps: Sweep or vacuum up the visible invading earwigs. Seal up cracks or other entry points. Remove debris from gutters and around entryways. Keep water and moisture away from structures. Replace white outdoor lights with yellow ones, which are less attractive to earwigs. **Indoor application of pesticide POISONS isn't recommended.**

FLEAS

At times fleas seem to be taking over the entire world. These bloodsucking pests not only are irritating to man and beast alike, but can also cause severe skin problems in both dogs and cats. Worse yet, as fleas become increasingly resistant to the synthetic chemicals science has produced for their control, pesticide manufacturers are making their products increasingly stronger — and more dangerous — in an attempt to keep pace with the parasites. Fleas are particularly annoying to people and pets, especially during spring and early summer when their numbers tend to increase dramatically. The common flea is the cat flea. Despite its name, it attacks both dogs and cats and will also bite humans. To keep fleas out of your home, control fleas on your pet and regularly clean pet sleeping areas. Adult fleas are truly the "vampires" of the insect world because they feed only on our blood and the blood of our pets.**A single meal of blood can keep a flea fat and happy for up to two months.**

Fleas are narrow, small, wingless insects, red, brown or black in color and are protected by a hard flat shell. They are hard to see and even harder to kill with volatile pesticide poisons - so why use any poison? When you try to find this tiny (1/32" - 1/3") invader, remember to check your pet closely behind the ears, at the base of the tail, on the stomach and between the toes. The flea has armor-like plates in layers - each with backward pointing spikes (or spines) so they can move easily and quickly through hair or feathers. Their feet have double claws for holding on to their host and they also have a barbed "mustache" under their mouth to further anchor them to the skin as they feed with their piercing-sucking mouth parts. The adult fleas create four stages of offspring — egg, larva, pupa and adult — that are present in your home for almost two years! Combine this with the fact that many commercial pesticide POISONS kill only the adult fleas, leaving healthy deposits of eggs and pupae scattered around your home, and it becomes easy to understand how it is that you can "kill every flea in the house" one week and be greeted by a whole new generation of the blood seeking little Count Draculas the very next week.

Flea bites cause an inflammation of the skin and can carry disease and parasites. Fleas can pull up to 400 times their own weight. Fleas literally "fly" with their hind legs; they can jump 150-200 times their body length (the equivalent of a man jumping 1,400-1,800 feet!) Behind their legs is a rubbery-muscular protein that allows them to move against gravity 135 times faster than you or me. After its lift-off, the flea cartwheels end over end, until it reaches its

new host/meal. One pair of mating fleas living for nine months can theoretically produce a quarter of a million little "vampires", or up to one trillion offspring in a single year! To the voracious little flea, dogs, cats, birds, humans or even elephants are simply something to eat.

Fleas have a complex, 4 stage life cycle. Control of fleas on your pet and in your home must address all stages of this life cycle to stop the problem of flea infestation. Only about 10% of the flea population (mainly the adults) are actually on your pet. The flea eggs, larvae, pupa, and the few adults that reside in the carpeting, bedding, and living areas make up approximately 90% of the flea population. Neglecting this population of fleas will ensure that the flea problem will continue and worsen over time. **Daily vacuuming** - this is *very important* for overall flea eradication. This will pick up (and get rid of) adults, eggs, larvae and pupae before they develop.

Frequently launder all pet bedding and rugs that pets frequent in hot, soapy water and dry in a clothes dryer or direct sunlight. Steam clean, vacuum or rinse-and-vac carpets with Safe Solutions, Inc. Enzyme Cleaner with Peppermint (1 oz. per gallon of water) and/or borax (½ cup per gallon of water) thoroughly to remove lint and dust around baseboards and cracks where flea eggs and larvae accumulate. Eliminate vegetation that will harbor native mammals and/or rodents. Prevent pets from resting under the building, and exclude wild mammals by screening attic and eaves entrances. Thoroughly clean furniture in areas that pets tend to frequent and use. Wash frequently using Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint. Most research shows adult fleas rarely leave the host (their primary environment); their second primary environment is the carpet/floor or nest/burrow which contains the majority of the flea eggs, larvae and pupae. **You must control both environments to control the flea infestation.**

The secret to flea population management is the flea's life cycle; the adult must contribute timely nourishment for larvae under special conditions or the young will not survive. No longer a regional problem, today fleas are common in all parts of the country except very dry areas (so properly install a dehumidifier). The most important and common species that you must manage is the cat flea which feeds on a variety of hosts, including cats, dogs, rodents, foxes, opossums and humans. This flea prefers pets and will not affect humans unless populations are excessive or the pet is removed from its resting areas. This situation occurs when families remove their pet, take a vacation and then return home to find ravenous fleas waiting for them. **An outline of the sequence of events:**

A summertime vacation assures good flea-growing conditions (temperature and humidity).

Taking the pet with you removes the main host/food supply for your fleas.

While the family is away, flea larvae continue to develop, feeding on dried blood; pupae complete their cycle and are ready to emerge; and the flea adults become ravenous.

The family returns to the adult fleas emerged and emerging - ready to feed and accept ALL available warm-blooded hosts - (including you).

Before you go inspect inside - put your pant legs inside your socks and wrap duct tape (sticky-side out) around your lower legs.

Fleas belong to insect order Siphonaptera. They are tiny wingless insects that undergo complete metamorphosis, having egg, larval, pupal and adult stages. There are over 2,400 described flea species in the world, 95% of these are parasites of mammals; the remaining species parasitize birds. Over $9 billion is spent (totally) by pet owners trying and trying and trying to get rid of fleas just in the U. S.! The fight has been going on a long time - W. Colas in his book Adam in Eden: or Natures Paradise published in 1657, noted that "water in which rue *(Ruta)* has been soaked, if scattered about the house, will drive away fleas and kill them." Whether or not you are aware of fleas in your home, regularly vacuum and launder areas where your pet rests to avoid flea buildup. If you have a major flea problem, treat your pet with Safe Solutions Pet Wash or their Tweetmint Enzyme Cleaner and follow these steps:

Treatment of your home must begin with a thorough cleaning. Frequent vacuuming of the house, especially pet areas, is necessary to keep fleas at bay. Pay special attention to dark, damp places where fleas may have deposited their eggs. After vacuuming, the cleaner bag shouldn't be left in the closet, since the flea eggs it contains can hatch and reinfect your house. Empty the bag and burn the contents, or seal the sweepings in a plastic trash bag and dispose of it properly. Next, wash your pet's bedding and finish off any six-legged survivors by tumbling the wet bedding in a hot dryer. Food-grade diatomaceous earth can now be lightly sprinkled on the clean pet bedding, as well as on carpets and floors, and worked in with a broom.

Locate heavily infested areas (usually areas where the pet rests) and concentrate treatment there. Wash throw rugs and pet bedding. Vacuum upholstered furniture, cleaning under cushions and in crevices. Daily vacuum carpets, especially beneath furniture. Use a hand sprayer or aerosol to treat all

carpets and upholstered furniture with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per quart of water) as needed. Over the next two weeks vacuum regularly to remove adult fleas that emerge from pupae. Seal vacuum bags and discard them so fleas don't escape**.**

Tapeworms and fleas - Cat fleas sometimes carry an intestinal parasite called dog tapeworm, *Diphylidium caninum*. The dog tapeworm has an interesting life cycle. It lives in the intestinal tracts of dogs, cats and sometimes humans. These long, flattened worms consist of up to 200 body segments (called proglottids) and may reach a length of 12 inches. When mature, these segments detach from the main body of the tapeworm and wriggle from the anus of an infected animal. Fresh tapeworm segments are opaque white or pinkish white, flat, and somewhat rectangular. When newly emerged, they move with a stretching-out and shrinking-back motion. When dry, the segments are yellow or off-white, less than 1/16th inch long, rice-shaped sacs. Each sac contains tapeworm eggs. Tapeworm egg sacs are frequently seen attached to hairs around the pet's anus, in feces, or in the bedding of infested pets. Flea larvae feed on tapeworm egg sacs. Once inside the flea, the tapeworm eggs hatch and the flea becomes infested. Infested adult fleas carry a stage of the tapeworm that can mature and multiply if the flea is swallowed by a pet. During grooming, pets often ingest such tapeworm-infected fleas. Once released into the pet's digestive tract, tapeworms mature into adult forms. **On rare occasions, small children may ingest fleas and become infested in this way. If you see proglottids in your pet's feces or bedding, you should have your pet treated. The Author has used Safe Solutions food-grade DE to remove these parasites and even heart and lung worms in his pets.**

Summary: Fleas are small, wingless insects that feed on the blood of animals and people.

Americans spend about $9 billion a year controlling fleas – one of the biggest expenses for pet owners. Buildings sometimes become infested with fleas even when there are no pets around. Fleas that have fed on rodents may transmit diseases, including plague and murine typhus. For this reason, avoid close contact with wild rodents such as squirrels, rats and prairie dogs. Their fleas can bite you and may transmit disease. Cat fleas, however, do not carry plague. An intelligent flea control program includes good sanitation and treatment of your pet and environment. You can eliminate fleas from your home with proper treatment, but it may take time, especially if the flea infestation is heavy. Change and launder pet bedding regularly and

vacuum thoroughly. Vacuuming removes up to 30 percent of the larvae and up to 60 percent of flea eggs from a carpet, as well as the larvae's food supply of dried blood. Vacuum under furniture, cushions, chairs, beds, and along walls. Discard vacuum cleaner bags at least once a week. Fleas can continue to develop inside vacuum cleaner bags and re-infest the house. The fleas will not survive in the bag if you add some food grade DE or baby powder. Your pet's first line of defense against fleas is a flea comb and a good bath. Soap acts as a gentle insecticide and helps control light infestations on your pet. Though time consuming, combing helps reduce the need for insecticides. Flea combs have fine teeth that remove adult fleas from fur. Most dogs and cats seem to enjoy this treatment; pay special attention to the face and neck, and the area in front of the tail. Dip the comb frequently in soapy water or an alcohol solution to kill fleas removed from the pet. **Or simply bathe your pet using Safe Solutions Pet Wash** - www.safesolutionsinc.com/Nontoxic_Flea_Shampoo_Treatment_Control_Pet_O

FLIES

Flies belong to the insect order Diptera and are related to mosquitoes and gnats. Of the more than 700,000 known species of insects, well over 110,000 are flies. Diptera means two ("di") wings ("ptera"), and it is on the basis of this single characteristic (one pair of wings) that all the species of flies are grouped together. As stated, Diptera literally means "two-winged" and, indeed, only the front pair of wings are functional and they are clear and membranous. The hind wings are represented by a pair of small knob-like or club-shaped organs called halteres or balancers. These small, vibrating structures aid in flying and are in place of a second pair of wings. The vibrating halteres have their own set of control muscles that are controlled by the fly's visual system. Without them flies tumble and crash; with them, they can change course without a wobble in less than 30 milliseconds - and make the fly extremely hard to swat. The adult fly does not possess mandibles, but the mouthparts are modified into a proboscis for sponging/lapping or piercing and sucking. Flies are cold-blooded insects that move about looking for external heat sources; most flies are diurnal and are attracted to certain wavelengths of light**. Flies buzz around windows and can be easily vacuumed up by windows or lights.** Most flies have large compound eyes and usually three simple eyes. Each of the fly's compound eyes has about 4,000 six-sided lenses - so they can detect the slightest movement. Flies taste with their feet. The larvae or maggot is legless and the head is often reduced or indistinguishable and retracted into the thoracic segments. The two-winged flies constitute a larger order of insects and well over 110,000 different species are known throughout the world. This group forms one of the most highly specialized of insect orders and many species are of the utmost significance in regard to human welfare. **If there is anything as "harmless as a fly", it is certainly not the common housefly or any of its relatives.**

Filth flies carry disease-causing organisms and can be a threat to public health. These flies breed in bacteria-laden environments, such as feces, carrion, and human food waste, often in close proximity to humans or domesticated animals. Filth flies include some of our most common fly pests — house flies, fruit flies, green bottle flies, stable flies, and several others. A single house fly can carry over one million bacteria. No less than 60 different diseases can be transmitted by filth flies, from salmonella to dysentery. Most filth flies can reproduce quickly in warm weather. To keep fly populations under control, you must limit the places where they can breed and feed. Diseases, e.g., malaria, dysentery, sleeping sickness, onchocerciasis, elephantiasis and yellow fever are

carried or transmitted from man to man by bloodsucking dipterous flies. **Many other diseases are transmitted mechanically by flies due to the habit exhibited by many species of sucking liquid from excreta and other decaying organic matter and then settling on and vomiting and/or crapping directly on to your food or drink.**

The fly was made to distribute quantities of pathogenic disease organisms. Its 6 feet are equipped with bristles and sticky pads and its proboscis is hairy. A sticky liquid comes out of the hollow hairs on their feet allowing them to walk upside down and on glass, etc. The fly's digestive tract is an incubator for germs! My mother began to teach me IPM control when I was a very young boy. She said, "Shut the door you are letting in the flies!" This is still good advice - even better is to have a second entry door as an extra barrier against fly invasion.

All flies pass through four distinct stages of their life cycle: egg, larva, pupa and adult (complete metamorphosis). The synanthropic (attracted to habitats) filth flies look for any warm, filthy, moist environment in which to lay their eggs, since their larvae feed and grow under these conditions. An adult female housefly may lay up to 2,400 eggs in her lifetime, singly or in groups. More than a thousand flies and 2,000 maggots a week can be produced in just one dirty garbage can! Fly larvae, called maggots, have a wide range of feeding habits depending on the species. Some larvae feed on plants and can be serious agricultural pests. Others feed on rotting or decaying plants or animals, or on animal excrement. Maggots of other species are internal parasites of arthropods or vertebrates. Most adult flies are winged and fly readily. Flies and all other dipterans only have one pair of wings, as opposed to other orders of winged insects, e.g., bees, termites, moths, etc. which have two pairs. **Routinely steam clean or spray/clean/mist all infested areas with Safe Solutions, Inc. Enzyme Cleaner with Peppermint and/or borax**.

Of the five most serious diseases in the world, flies, including mosquitoes, spread the organisms that are responsible for four: Malaria, sleeping sickness, Leishmaniasis and filarasis. They also are responsible for spreading yellow fever, typhoid, parathpoid, bacillary dysentery, pinworms, roundworms, whipworms, hookworms and tapeworms and various diarrheal illnesses. In the United States, the toll of the worst afflictions - heart attacks, cancer and strokes - is annually numbered in the thousands; in the tropics, the dead and disabled from fly borne diseases are counted by the millions. In the United States flies are considered more annoying than dangerous, but as recently as the turn of the 20th

century, malaria and typhoid were major health problems. The activity of flies is a nuisance and the accumulation of dead adults is a respiratory hazard for many people**. A well fed fly defecates at least once every 5 minutes! So routinely clean with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per gallon of water)!**

There's nothing a filth fly likes less than cleanliness and proper sanitation. Adult flies need a filthy place to lay their eggs, and a clean home and yard just won't appeal to mama fly. Here's how to keep flies from breeding in or near your home.

Clean up all pet and animal feces promptly. Any fresh, moist animal feces will draw flies. To keep flies from breeding in your dog's doo-doo, either bury it immediately or use a pooper scooper and plastic bag to remove and seal the feces. Place the bagged waste in a lidded garbage can. Or feed your pet Safe Solutions food-grade diatomaceous earth (DE).

Promptly dispose of kitchen scraps and other organic waste properly. When it comes to food waste, the drier the better. Drain any moisture you can from it before throwing it away. Scrape your plates or other leftovers into a plastic garbage bag, tie the bag shut, and put it in a garbage can with a tight fighting lid.

If you save kitchen waste for your compost heap, add some sawdust to your scrap bin to help absorb moisture and odors that might attract flies. If your compost pile does not heat up sufficiently, those kitchen scraps may attract breeding flies. Turn your compost pile regularly, and don't put meats or animal waste into your compost bin.

Garbage cans and dumpsters are favorite breeding areas for flies. You can significantly reduce fly populations by keeping lids tightly closed on your trash cans, and making sure the cans have no holes. All garbage within the can should be bagged and tied closed. Don't forget to put your garbage out for collection regularly. It's not a bad idea to scrub out your cans now and then with Safe Solutions Enzyme Cleaners to remove any food or pet waste residue.

Recycling cans also attract some filth flies. Rinse empty soda cans, beer bottles, and pet food cans before tossing them in the recycling. If possible, use a lidded recycling container.

If you have fruit trees in your yard, pick up any fruit that falls on the ground. Fermenting or overripe fruit provides just the right combination of moist and sweet to attract flies.

Indoors, take care not to overwater your houseplants. Prune and discard of any

dying plant parts. Fungus gnat larvae feed on fungi that develops in moist soils and on decaying plant matter.

Physical Controls for Filth Flies - Following all the sanitation rules above will significantly reduce, but not completely eliminate, flies in your yard and home. You can further limit the numbers of these unhealthy pests by using appropriate barriers and traps.

Use a fly swatter or, better yet, simply vacuum up all visible flies.

Routinely clean with 1 oz. of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint per gallon of water. Institute proper food and garbage storage.

Daily empty and clean all food handling equipment, dishes and garbage containers and daily remove and/or bury all droppings, fruit and organic debris inside and/or outside.

Add (1 oz. per quart) Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint to the drains each week.

Double bag and securely tie each garbage bag. Schedule twice weekly summer garbage removal. Caulk, seal and screen all openings.

Spray or sprinkle dry soap or borax into garbage cans or dumpsters after they have been washed (with 1 oz. per quart of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint) and allowed to dry; it acts as a repellent. It is best to wash and spray with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint first.

Place tansy near your kitchen door or where flies tend to cluster. Other repellents include oil of cloves, oil of peppermint or other essential oils and/or mint springs. Try an aroma-therapy machine to dispense these fragrances and repel your fly problems.

Set a sponge in a saucer and soak it with oil of lavender to repel flies.

A pot of basil set on a window sill or table will help reduce the number of flies in the room.

Spray or mist any remaining visible flies with (1 oz. per quart) Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint.

Make and use some fly traps - either 2 liter soda containers or imprinted glue traps.

Flies and flying ants and other flying insects are attracted to the light, so darken all windows but one, or turn off all lights but one and/or install one black light or ultraviolet light and then vacuum up those pests that are attracted.

Mix 90% honey or molasses (the fermenting kind) and 10% food-grade DE as an excellent fly bait. **Keep any any/all baits away from children, pets and wildlife.**

Feeding food-grade (amorphous) DE to animals (cattle, sheep, horses, dogs, swine, goats, emus, etc.) at a rate of 1% - 3% of their feed ration controls internal parasites and prevents fly larvae (maggots) from developing in their excrement (droppings).

Install and maintain tight-fitting window screens. Check your screens for holes or tears, and repair them as needed. Caulk and seal any openings around windows, doors, or in your foundation.

Sticky fly paper does work, but is most useful when fly populations are low. If you've followed all the steps to limit breeding sites, hanging a few sticky fly paper traps will do the trick on the few that wander into your home. Still, you might not like having a ribbon of dead flies hanging from your ceiling. Commercially available fly traps work well, especially for house flies. Traps usually contain some kind of food bait, sometimes in combination with a pheromone. Place fly traps where you see the most flies.

GOPHERS

Gopher is the common term for any of several distinct species of small burrowing rodents endemic to North America, including: the pocket gophers (family Geomyidae, also called true gophers, and some ground squirrels (family Sciuridae), particularly prairie dogs and Richardson's ground squirrels. Gophers are small burrowing rodents that feed on roots of many types of plants. Gophers weigh around 0.5 pounds, and are about 15 inches long in body length, with a tail 7 inches long. Their lifespan is normally 2–3 years (assuming no diseases or predation). Gophers dig tunnels and subterranean chambers, and are associated with the rodent order, Rodentia. There are over 100 kinds of gophers in America. Gophers, because of their burrowing, can disrupt human plans like commercial agriculture, garden plots, some landscaping, and some underground cables. This has led to their frequent treatment as pests. Gophers are generally timid but may attack if provoked. If deprived of their normal vegetarian food supply, gophers have been known to resort to cannibalism. Do you feel like Bill Murray in the movie Caddyshack with the moles in your yard? The resistant pest gophers clearly drove Bill Murray insane in his vain attempts to control them!.

A single gopher can ruin a garden in a short time, and gopher gnawing can damage irrigation lines and sprinkler systems. In lawns, their mounds are unsightly and interfere with mowing. Early detection is critical to prevent damage. Use both traps and underground fencing to manage gopher problems. Toxic baits are available but can pose threats to wildlife, pets, and children, especially in backyard situations. **DO NOT USE THEM!** *Euphorbia lathyris*, better known as “Gopher Spurge”, is believed to repel both gophers and moles. Plant this plant species throughout your yard; especially in areas that are prone to infestations. Most nurseries sell the plant for this specific reason. Pet waste is another popular method of getting rid of gophers. Instead of tossing cat litter or dog poop into the trash can, next time use it to plug/fill gopher mounds and tunnels. This method of gopher control is also inexpensive. Try some predator urine. Flood their tunnels with carbon dioxide - either use dry ice or a container of CO2 with an air hose and rod (protect your hands with gloves).

Keep your eye out for gopher mounds. Gophers spend almost all their time underground in their burrow and aren’t commonly seen. Look for mounds of loose dirt that are half circles or crescent-shaped with a plugged hole that is off to one side of the mound. Fresh mounds are the sign of an active gopher. A

single gopher can create several mounds a day. In contrast to gopher mounds, mole mounds are circular with a plug in the middle and ground squirrel holes are unplugged without a mound. **Protect plants with underground fencing.** Lay hardware cloth or 3/4-inch mesh poultry wire under raised beds before planting. Wire baskets to protect individual shrubs or trees can be installed at planting, leaving enough room for roots to grow. Use traps to reduce the gopher population. Because a gopher continually returns to an open-surface hole while it is expanding its burrow, it is relatively easy to trap using a device called a cinch trap. The trap is set and simply poked down into the opening. When the gopher returns to push out more dirt, it trips a mechanical sensor, and the trap snaps the gopher's neck, killing it instantly. The cinch trap can be reset in a minute or less and doesn't require digging. Its ease and efficiency make nontoxic gopher control viable even for farmers with large acreages and for homeowner associations with extensive landscaping. It is more difficult to trap a gopher that has settled into its burrow. Without open holes for a cinch trap, a trapper must dig through 15 to 30 inches of soil to find a main tunnel, then set an in-line trap in the hope of catching the gopher as it makes its rounds of the burrow. One of the most common tunnel traps is the Macabee trap. Gopher traps are placed underground inside the gopher burrow, so you must use a gopher probe to locate the burrow. Be sure to place traps in active burrows as indicated by fresh mounds. Two common types of traps are pincer traps and box traps. Set traps in tunnels in pairs facing each other. Cover the hole so light doesn’t get in. Check traps often and reset as necessary. Keep trapping until no new mounds are formed. Gopher traps don’t require food baits. Avoid products and methods that aren’t proven. Although many predators feed on gophers, installing of owl boxes is unlikely to reduce gopher numbers enough to prevent damage. No repellents currently sold successfully protect plants from gophers. Plants such as gopher purge, castor bean, and garlic haven’t been shown to repel gophers from an area. Frightening devices such as vibrating stakes, ultrasonic devices, and wind-powered pinwheels haven’t been effective in research trials. Fumigation with carbon dioxide is safer and more effective than smoke or gas cartridges because gophers can seal off their burrows rapidly. The Author also has used finely ground Ghost Pepper to repel gophers. **An adult barn owl will consume roughly 1,000 gophers a year.**

To summarize: The most effective control methods for gophers are trapping and burrow fumigation. Burrow fumigants can be very effective but are restricted materials, generally only available to and used by professionals. Burrow fumigants are not the same as the commonly available "smoke bombs"

which are not very effective. It is illegal in California to use carbon monoxide from car exhaust or other sources to kill animals. The Author uses carbon dioxide either as dry ice or in cylinders to fumigate tunnels effectively and safely. Traps can be purchased at almost any hardware store or home garden center and usually come with fairly complete instructions for their use. The key to successfully using traps or baits is accurate location of the main tunnel. Most people find it "by feel" using some sort of homemade tool or probe. What about flooding? Outside of agricultural settings where a large amount of water can be put on an area in a short period of time and left standing for an extended period of time, this control method has very little practical value for residential uses. The old "garden hose down the hole" method tried by almost everyone who has ever attempted to control gophers rarely works and is usually a waste of water and time. There are no repellents or scaring devices available at the present time that have been proven to protect lawns or other planting sites from pocket gophers. Several plants, such as gopher purge (*Euphorbia lathyrus*) and castor bean (*Ricinus communis*), have been purported to offer protection from ravenous gophers, but these claims have never been proven. Trying to keep gophers out of your yard or garden by using physical barriers can sometimes be effective if done on a small scale. Any large project, such as placing fencing around the perimeter of your backyard would be cost prohibitive and would at best only provide short term control. Raised flower beds can be protected by placing a layer of 1/4 inch galvanized hardware cloth under the bed and securing it to the 2x6 wood frame before filling with soil. In reforestation or orchard situations, a "cage" of hardware cloth lining the hole and extending six inches aboveground can give a young tree room to establish a good root system before being exposed to gopher damage. Six to eight inches of gravel 1 inch or more in diameter around underground utility cables or sprinkler lines may discourage gnawing by gophers.

GRASSHOPPERS

Simply spray garlic oil where you don't want them, or plant calendula, horehound (a bitter herb), or cilantro. **Or spray them with diluted Safe Solutions Tweetmint Enzyme Cleaner with Peppermint.**

GROUND AND TREE SQUIRRELS

Ground squirrels - Although similar in appearance to tree squirrels, ground squirrels will always retreat to a burrow when frightened, while tree squirrels will climb a tree or other tall structure and never use a burrow. Traps and baits will effectively manage ground squirrels in landscapes and gardens. Ground Squirrels have Brownish-gray fur and are nine to 11 inches long, not including a 5- to 9-inch tail that isn't as bushy as a tree squirrel's. They live in colonies in a burrow system where they sleep, rest, rear young, store food, and avoid danger. Ground Squirrels are active during the day, mainly midmorning through late afternoon, especially on warm, sunny days. They breed once a year, averaging seven to eight per litter. When six months old, young squirrels resemble adults. Ground squirrels cause damage by: Eating food-bearing and ornamental plants. Gnawing on plastic sprinklers and irrigation lines. Girdling young trees. Burrowing, which causes tripping hazards and damages to landscapes and structures. How do you manage ground squirrels? Use kill traps, such as box or Conibear traps, instead of live-catch traps. It is illegal to release squirrels in California and elsewhere without a written permit. Place box traps on the ground near squirrel burrows or runways. Bait traps with walnuts, almonds, oats, barley, or melon rinds. Trapping is effective between February and October. Fumigate the burrows with carbon dioxide. Always follow label instructions for use. Where ground squirrels are a problem on property next to wild lands or other infested areas, an ongoing management program is necessary. Squirrels will reinvade over time. Once you have controlled ground squirrels, periodically monitor the area for signs of reinfestation, such as new burrows. Restart control actions, such as trapping, as soon as you notice new ground squirrels and before the population builds back up.

Tree squirrels include over a hundred species that are found on all continents except Antarctica, and are the members of the squirrel family (Sciuridae) most commonly referred to as "squirrels". Squirrels are sometimes considered pests because of their propensity to chew on various edible and inedible objects, and their stubborn persistence in trying to get what they want. Their characteristic gnawing trait also aids in maintaining sharp teeth, and because their teeth grow continuously, prevents their over-growth. On occasion, squirrels will chew through plastic and even metal to get to food. Homeowners in areas with a heavy squirrel population must be vigilant in keeping attics, basements, and sheds carefully sealed to prevent property damage

caused by nesting squirrels. A squirrel nest is called a "drey". Squirrels are a serious fire hazard when they break into buildings. They often treat exposed power cables as tree branches, and gnaw on the electrical insulation. The resulting exposed conductors can short out, causing a fire. For this reason alone, squirrel nests inside buildings cannot be safely ignored. A squirrel nest will also cause problems with noise, excreta, unpleasant odors, and eventual structural damage. Once established in a nest, squirrels stubbornly ignore fake owls and scarecrows, along with bright flashing lights, loud noises, and ultrasonic or electromagnetic devices. However, squirrels must leave the nest to obtain food and water (usually daily, except in bad weather), affording an opportunity to trap them or exclude them from re-entering. Poisoning squirrels can be problematic because of the risks to innocent parties, and because the odor of a dead squirrel in an attic or wall cavity is very unpleasant and persistent. Trapping is often necessary to remove squirrels from residential structures. Effective baits include fruit, peanut butter, nuts, seeds and vanilla extract. An alternative method is to wait until squirrels have left in search of food, and then close up all their access openings, or to install one-way trap doors or a carefully angled pipe. The Author prefers to use strobe lights in the attic and/or finely ground Ghost pepper to repel tree squirrels. Attempting to get rid of all squirrels in a neighborhood is generally a futile goal; the focus instead should be on physically excluding them from places where they can do damage. There are other humane techniques to remove squirrels from buildings, but removal is ineffective unless steps are taken to prevent them from immediately breaking in again.

Ground Squirrel Summary - Thirteen-lined ground squirrels are not protected by federal law. They are protected by some state and provincial regulations. Thirteen-lined ground squirrels are very good at digging and climbing. They can be kept out of electrical substations or similar installations with hardware cloth topped with sheet metal. Most electrical substations or other secured installations are enclosed by a chain link fence that can be made ground squirrel-proof. Dig a trench 18 inches wide and 18 inches deep around the installation next to the outside of the existing fence. Install galvanized 0.5-inch or smaller mesh hardware cloth (6 foot wide) across the bottom and up the side of the trench nearest the existing fence, continuing 3 feet up the fence. Backfill the trench. Securely attach the hardware cloth to the chain-link fence. Attach a piece of sheet metal, 2 to 3 feet wide, to and above the hardware cloth. Adjust all gates to fit within 0.5 inches of the support post and the ground. It may be necessary to install a cement threshold to keep squirrels from digging under the gate. Activity in fields and gardens can be discouraged by deep soil cultivation,

which destroys burrows and changes the habitat. Allow grassy areas to grow as tall and as dense as possible, consistent with local land use practices. Such vegetation discourages ground squirrels but may encourage population of other small mammals, such as voles (*Microtus* spp.). Plant crops as early as possible, before the squirrels emerge from hibernation, to reduce losses to seeds and seedlings. There are no repellents registered, but the Author has used finely ground ghost pepper. Deter ground squirrels and other small mammals from feeding on crop seeds and seedlings by providing them with an alternative food source. At planting, broadcast 4 bushels of cracked corn per acre over the outside four to eight rows adjacent to ground squirrel habitat. It also may be necessary to spot treat fields in areas where damage is expected or observed, especially if conservation tillage is employed.

Fumigants (other than carbon dioxide) should never be used in or around buildings, or where there is any danger that people, livestock, or other non-target animals will come into contact with the gases. Treat and plug all burrows, wait 24 to 48 hours, and retreat any burrows that have been reopened. Repeat this process until all burrows stay closed. Most burrow fumigants work best when the soil moisture is high and the air temperature is above 50°F. A few ground squirrels around a home garden or small row crop operation can be removed easily using wooden-base rat-sized snap traps, glue boards, or live traps. Snap traps and glue boards can kill animals caught in them. If it is necessary to restrict access to traps and glue boards by non-target animals, place the traps under inverted wooden boxes with a 2-inch hole cut in each end. This will, however, reduce trapping success. Wooden-base rat-sized snap traps are readily available and the easiest to use for most home gardeners. The biggest mistake most people make when trying to trap nuisance animals is not using enough traps. Set traps in the areas where damage is occurring, next to active burrows, or on active runways. Peanut butter is one of the most effective baits and is difficult for the ground squirrel to remove without springing the trap. Pieces of apple or other fruit, vegetable, or nut meat, can also be used as bait. Securely attach these baits to the trap trigger.

You can increase the attractiveness of most traps by scattering about 1/2 teaspoon of rolled oats on and around the trap. Cover the set, leaving enough room for proper operation of the trap. Check the traps every 24 hours and apply fresh bait. If more than 2 or 3 days go by without the trap being sprung, move the trap to a new location. If the bait is taken without the trap being sprung, try using mouse-sized snap traps. Young ground squirrels may not be big enough to spring the rat-sized trap. Glue boards, either commercial or homemade, can be

used to capture nuisance ground squirrels in residential areas. Place glue boards in areas where activity or damage is occurring. Bait them with the same type of material used to bait snap traps. Place bait in the center of the board. Once the animal becomes trapped, it can be killed and disposed of. Glue boards do not work well in dusty, dirty environments. Care should be taken when using glue boards outside because they can be attractive to children, pets, and nontarget wildlife.

Cage traps are commercially available from a variety of manufacturers, or they can be homemade. Use live traps that are 3 to 5 inches square and 18 to 20 inches long. The 5 x 5 x 18-inch chipmunk-sized trap works well. Burrow-entrance cage traps can be constructed using 0.5-inch hardware cloth. The main body of the trap is formed from a 12 x 20-inch piece bent to form a rectangular box 3 x 3 x 20 inches. The joining edges can be secured with hog rings. Use hog rings to secure a 3-inch square piece of hardware cloth to one end of the trap. The trap door is made from a piece of hardware cloth 2 3/4 x 8 inches. Attach one end of the door to the top of the trap with hog rings. Recess the point of attachment about 1 inch to permit free movement of the door when the trap is placed in the burrow entrance. Bend the opposite end of the door so at least 2 inches of the door are in contact with the trap floor when the door is closed. A wire handle should be attached to the top of the trap. Before setting the trap, spend some time observing the squirrels to determine which burrows are active. Set the trap by wedging the door end firmly into the entrance of an active burrow. The closed end should be pointing into the air. Prop the trap in position with a block of wood or other suitable object. Gravity will hold the door closed until the squirrel pushes past it to leave its burrow and enters the trap.

Dispose of trapped animals in accordance with local regulations. Snares made of 8 pound test monofilament or wire fishing leader are simple and effective. Leghold traps (No. 0 longspring or coil-spring), and Conibear® traps (No. 110) can also be used. However, the effort required to set them, compared to snap traps, glue boards, and burrow-entrance live traps, makes their use questionable. Shooting can provide control if the landowner is willing to put in the necessary time and effort. All shooting should be carried out in a safe manner and in strict accordance with local regulations. Ground squirrels were often captured by the Native Americans that lived on the central plains and the west coast by pouring water down the animal’s burrow, thereby forcing the squirrel to the surface. Similar methods of removing ground squirrels still work. Flooding can enhance the effectiveness of trapping and snaring. Avoid flooding burrows that are adjacent to building foundations or other underground

structures that may be damaged by water. **The Author prefers to use a 5 gallon bucket 3/4 full of water with a layer of seeds covering the surface and a stick to the top giving the pests access to the seeds.**

Tree Squirrel Summary: Make sure shrubs and trees are farther from the house than your pest squirrel can leap. About 5 feet deters squirrels from jumping. Squirrels come in through holes as small as 2 inches or as big as a baseball. During daylight, head up to the attic and look for light shining through cracks or holes in home's exterior. Can not access the attic from inside? Use binoculars and watch from your lawn chair. Seal all but one entry point when squirrels are not home. Once you are sure they have all left, seal up all entry points except the one they are using the most. Some sealing options: Stainless steel mesh, sheet metal, or aluminum flashing that can not be chewed through. Use caulk or foam sealant to close up holes. Caulk and foam can be painted over. When you are positive all the squirrels are out of your home, close off their main entry. Figure out if baby squirrels are in your home. If a mother with a litter is involved, getting rid of the squirrels is more complicated. If you seal up your house so the mother can not return, the mama will spend all her waking hours trying to get them out. Plus, you could end up with dead baby squirrels inside your home.

Here is how to check for babies: Take a flashlight, put on gloves, and a dust mask, then head into the attic or under the house. Look for a nest within 20 feet or so of the squirrel's main entryway. **Caution: Do not get too close because if the mama squirrel thinks you are after her young, she will attack you**. Make some noise and listen for babies. If there is a squirrel family, the humane thing to do is to let them continue to live in your house for two months or so until the babies are old enough to leave on their own.

Repellant tactics: Drive them out with sound and light. Even squirrels like a peaceful night's rest. You may be able to get your intruders to leave by putting a radio tuned to a talk station and a lamp in the area where the squirrels have nested. Use a strobe light or a cool-burning LED bulb, not a hot incandescent. You can also try a trap or one-way door. For about $65 you can buy a one-way door or a trap. The one-way door lets squirrels out but not in. The trap catches them so you can release them at least 3 miles away. Put out predator urine. Farm supply stores and online retailers sell predator urine ($20). Putting some rags soaked in predator urine near the entryway or nest while the squirrels are out of the house may make them think a fox moved into the neighborhood and they might leave. **The Author has found that sprinkling finely ground Ghost Pepper will literally make them run away!**

JAPANESE BEETLES

Try planting chives, garlic, rue, and/or catnip to repel them. **Or spray them with diluted Safe Solutions Tweetmint Enzyme Cleaner with Peppermint.**

LAWN INSECTS

Contrary to popular belief, insects do not commonly cause damage to your lawn. Poor lawn care, especially ill-timed watering and planting a grass blend not suited to your yard, are more likely causes of unhealthy or dying lawns. Plant disease, excess or inappropriate use of chemicals such as fertilizer and herbicides, or dog urine also produce similar damage. Never apply an insecticide POISON unless a damaging level of a known insect is confirmed. Insecticide POISONS are effective only if applied at the right time and in the right manner. **Many insecticide POISONS can harm you and yours and will also kill good bugs—use them only as a last resort.**

Keep your lawn healthy.

Plant grass species that will do well in your area.

Overseed thin areas in the spring and fall.

Water deeply and infrequently.

Perform routine maintenance on sprinkler heads.

Apply composted chicken manure fertilizer appropriately.

Aerate your lawn annually; remove thatch if it exceeds 1/2 inch.

Cut only 1/3 of grass height at each mowing and keep lawnmower blades sharp.

How do you know if insects are causing damage?

Brown spots in lawns also can be caused by over- or underwatering, plant disease, a fertilizer/herbicide spill or over-application, or dog urine.

Confirm that insects are present at numbers high enough to cause damage before applying any insecticide POISON or soil treatment.

For grubs, dig around roots. A few grubs will not do serious damage, but 6 or more per square foot can. Apply composted chicken manure.

For other insects, perform a drench test as described on reverse.

If you do not find live pest insects at high levels, do not treat with anything other than composted chicken manure.

If there is a damaging number of insects:

First see if you can alter your lawn environment to discourage the pest.

If an insecticide POISON is required, select the least toxic product available for the pest you are targeting.

Find out an alternative treatment which targets your specific lawn insect:

Bacillus thuringiensis (Bt) and spinosad are least toxic pesticides that kill caterpillars.

How to Perform a Drench Test

Mix 3–4 tablespoon of dishwashing liquid to 2 gallon of water.

Evenly apply the 2 gallon to 1 square yard of your lawn.

Watch the area for 10 minutes and count the number of caterpillars that rise to the surface.

Treat the area only if insect numbers exceed 5 armyworms or cutworms or 15 lawn moths per square yard.

The most important aspect of pest management in a lawn is maintaining healthy soil. Grasses that are stressed or not growing under optimal conditions may be more attractive to pests or be more susceptible to their damage. Healthy turf may (and should) contain a variety of beneficial or neutral (neither pest nor beneficial) insects. Some of the beneficial insects include ground beetles, rove beetles, predatory and parasitic wasps, non-pest ants. Some insects may be beneficial and prey upon harmful ones or just be neutral to the turf environment. Predatory beetles and some small flies can be predatory on turf-consuming caterpillars. Unnecessary pesticide POISON use may reduce the beneficial insects and micro-organisms that are actually suppressing the pest caterpillars. Unnecessary use of pesticide POISONS and synthetic fertilizers can also remove enough of the other beneficial organisms that weeds and other pest infestations may rebound to more severe levels than before your POISON "treatment".

A network of the soil microorganism - arbuscular mycorrhizal fungi - act as an underground intercommunications system between plants to warn off aphid attacks, a recent study from the University of Aberdeen in the UK revealed. Bean plants (*Vicia faba*) free of pea aphids (*Acyrthosiphon pisum*) were found to release aphid-deterring chemicals when neighboring plants were under attack. Such a chemical response was previously only associated with plants directly under attack. These chemicals also attracted the aphid predator - the parasitoid wasp (*Aphidius ervi* Haliday) - that keeps aphid populations down. The response was dependent on the arbuscular mycorrhizal fungus (*Glomus intraradices*) that forms branching mycelial networks between the plants. This remarkable phenomenon is an example of interspecific symbiotic relationships, many of which researchers are yet to fully comprehend. It is an aspect of agricultural science totally ignored by industrial farming systems. Pesticide and

herbicide POISONS kill soil microorganisms and damage mycorrhizal/plant associations. **This study helps explain the effects of Monsanto's Roundup herbicide, which has been blamed for the epidemic spread of plant diseases associated with the planting of Roundup tolerant GM crops.**

A simplified list of environmental factors important to a healthy lawn is: 1. nutrients- not too much or too little fertilizer 2. pH- soil acidity can affect turf nutrient uptake and growth. It can also preferentially determine weed species. 3. water- too little or too much can stress lawns 4. light- most grasses require good light exposure. Many lawns are underexposed. and 5. temperature- temperature cannot be controlled directly, but grasses do not grow the same at all temperatures.

Weeds, grubs and some burrowing insects can be a huge threat to the integrity and health of your lawn or garden, therefore you need to get rid of them quickly and efficiently without harming the other plants and grasses that are beneficial and decorative. The best way to get rid of weeds is to prevent them by changing the condition of the soil by using properly composted chicken manure. Grubs and other burrowing insects are often hard to detect, so being aware of the signs of pest infestation is important. Brown or dying areas of grass are a good indication that there might be a grub infestation. To check for grubs, you should take a small sample of lawn, perhaps a few square inches. Finding one or two grubs in the sample is usually not a major cause for concern, but any more than that and you should add composted chicken manure to your soil**. The Author has simply used composted chicken manure to remove grubs in a few weeks, moles in a few months and weeds in a few years. In addition to the safe and far more effective pest control your lawn will outshine all the others in the neighborhood**. Want quicker control? Use a hose-end sprayer and apply Safe Solutions Enzyme Cleaner with peppermint at a rate of 2 oz. per gallon.

LICE

The head louse *(Pediculus humanus capitas)* (DeGeer), the body louse *(Pediculus humanus humanus)* (Linnaeus) and the crab louse *(Pthirus pubis)* (Linnaeus) all occur on humans. All three cause considerable skin irritation as they feed on human blood or crawl on the body. Typhus, impetigo, trench fever and relapsing fever have all been transmitted by body and head lice. Scratching can lead to secondary bacterial infections leaving children feeling achy, feverish and/or lethargic. Human lice can establish and maintain themselves only on humans. A louse cannot hop or jump. They can, however, crawl fast. They are usually transmitted only through close personal contact. They are less frequently transmitted through the sharing of personal articles or toilet seats. For head lice, this includes combs, brushes and other grooming aids, hats, headbands, helmets, caps, headrests, wigs, curlers or other headgear, especially when these items are stored in shared lockers. They spread or infest by crawling, they live by biting and sucking blood from the scalp and can survive for up to 48 hours off a human head, and the nits on a hair shaft can survive from 4 - 10 days - so vacuum thoroughly and/or routinely spray/clean with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint.

Head lice infestations have been a problem a long time - Pliny, a Greek naturalist (23-79 AD) suggested bathing in viper broth. Montezuma paid people to pick nits off his subjects, dried them and then saved them in his treasury. W. Coles in his 1657 book Adam in Eden: or Nature's Paradise noted that the oil from hyssop (*Hyssopus*) "killeth lice." Nicholas Culpeper in his 1681 The English Physician Enlarged recommended tobacco juice to kill lice on children's heads, a very early reference to the use of tobacco as an insecticide poison. Medical historians trace head lice infestations back 9,000 years! In the U. S. head lice are not "known" to spread disease or cause serious injury - they are only considered to be "repugnant". Like other U. S. public health agencies, the National Center for Disease Control and Prevention have never tracked head lice outbreaks, said official, Tom Skinner. Sometimes called "mechanized dandruff." **Head lice may be nasty, itchy and very contagious, but the pediculicide poisons sold to supposedly get rid of lice are even more harmful!!**

Important Note: Among the health reactions to pediculicide POISON shampoos or lice "treatments" are seizures, mental retardation, many different allergies and respiratory problems, strange tingling, burning, itching, attention deficit disorders, brain tumors, leukemia, cancer and

death. The Author does not suggest the use of pediculicide poisons to *control* lice.

Thoroughly vacuum each room daily wherever lice have been a problem and spray carpets and floors with (1 oz. per quart) or mop floors with (1 oz. - 2 oz. per gallon) Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or borax.

Read the entire chapter on Lice located @ : www.thebestcontrol2.com.

The Author also has used ½ oz. of Safe Solutions, Inc. Lice R Gone® Enzyme Shampoo and/or their Tweetmint Enzyme Cleaner with Peppermint per shampoo-type application to **safely remove lice and nits without combing!.** These non-poisonous enzyme shampoos make the hair so slick lice and nits can't stick and lice can not live off the body for very long.

Be sure each child uses his/her own locker or hook and clothes and hair ornaments, combs and brushes.

Note: Lice are host specific; there are lice that attack goats that will not attack cattle. There are lice that are common external parasites affecting cattle, sheep, goats, swine, poultry and other livestock. Many organic farmers are looking for safe ways to control these pests without using dangerous, synthetic, chemical insecticide poisons. **They should first try a fine-toothed metal lice or flea combs, Lice R Gone® or Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint**. Vigorously shampoo with **Lice R Gone®** enzyme shampoo per label directions and then, while still wet, you can choose to comb with a regular comb to detangle the hair and then a fine-toothed metal flea or lice comb should be used to comb 1" sections of hair in order to remove the loosened nits. **Then manually inspect the hair with a bright light for any remaining lice or nits before you rinse.**

There are two kinds of lice that affect cattle/cows: biting lice and sucking lice. Lice are passed between animals as they feed or crowd together. Biting lice move along the topline (spine) and are about the size of a pin head, straw-colored and soft-bodied. Biting lice feed on dead skin and hair follicles. They are very common on cattle, sheep, goats and swine. **All will be removed with Safe Solutions, Inc. Tweetmint enzyme cleaners or Lice R Gone®.** Sucking lice are blue-black and very small; they are attached to the skin. Inspect for them by scraping the skin with a knife and shaking the scrapings onto a stiff piece of white paper. Wash or (better yet) dip each animal from nose to tail with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and borax. Repeat treatment in 2 - 3 weeks. The enzyme/borax wash will still be effective in

a dip tank and will control all other ectoparasites. Mix at a rate of 1 quart of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and 5 pounds of borax to 50 gallons of water. **(Note: You do not need the borax for lice and it should never be ingested!.)**

The word "lice" in Hebrew is "kinim" - one of the plagues G-d sent to punish Egypt was lice - even to this day parents and farmers respond to lice like they are truly plagues. Exod. 8:16-18. A staggering 20 million Americans find out each year we live in a lousy world - when they become infested or plagued with lice! The really lousy part of this is many are treated repeatedly with dangerous, volatile, synthetic pesticide poisons that no longer control the lice; **some people have treated their children 10, 20 and even 30 or more times with over-the-counter poison shampoos without getting rid of the lice**! **Lice R Gone® normally removes lice and nits in ten minutes without combing!**

Enzyme, Surfactant and Peppermint Caution: A few people may experience moderate skin irritation and/or slight eye irritation when using a combination of enzymes, surfactants and/or peppermint oils, such as those in Safe Solutions Enzyme Products. But that is nothing compared to the dangers of lice POISON "treatments". There is nothing that is completely safe – even a single organic peanut can make over a million and a half Americans deadly ill!

Caution: Before "treating" with any volatile pesticide poison shampoo or lotion, read the Material Safety Data Sheets (MSDS) for not only the active poison ingredient, but also for all of the "inerts." Never apply any pediculicide poison shampoo in the shower. The warm, close environment can allow a dangerously high amount of the poison to be absorbed. Observe all warning labels. Do not use a shower cap. These poisons are especially dangerous for pregnant or nursing women, children younger than 2 months, or anyone with asthma. **Pediculicide POISONS are not as safe as the Safe Solutions alternatives!**

As a safer but not as effective alternative, routinely shampoo with salt water and start combing - Once lice are detected, plan on spending one full day for each initial treatment, then daily for at least 2 weeks. Give yourself at least an hour per head - and with long hair, as much as two hours per head. Make sure your child is comfortable and occupied. Use an entertaining video, arts and craft project or coloring book to keep your child entertained and engrossed. Use a bright light, magnifying glass and metal (flea/nit) comb. Wash with hair conditioner and comb through each strand from top to bottom, removing nits

with fingernails, combs, blunt scissors or tweezers. If the nits will not budge, snip off the hair. **Recheck your child's head every 3 - 4 days for several more weeks.**

Start cleaning - Everything that has been in direct contact with the infected child - bedding, clothing, towels, toys, dolls, cars, furniture, hats, combs, brushes - must either be vacuumed, laundered and/or dry cleaned daily; any items that can not go through the washer or the dryer or be thoroughly vacuumed should be placed in sealed plastic bags and kept isolated for at least 2 weeks.

The 1997-1998 head lice season had been particularly bad. Even in February, 1998 school nurses and parents were still telling the Author that children had their head lice "treated" with poisons 10 - 20 or even more times! Some children's parents were using over-the-counter poison treatments virtually daily to "treat" the resistant lice, even though the poison shampoo labels clearly warns people not to use these toxins more than once every 2 weeks! Never use any volatile, synthetic pesticide poison more than twice after it fails the first time! Safe Solutions, Inc. Enzyme Cleaner with Peppermint and Lice R Gone® do not contain any registered pesticide poisons and they have safely controlled even pesticide resistant lice. **You can also order any of these products directly from Safe Solutions, Inc. at 1-888-443-8738 or online from www.safesolutionsinc.com or at licergone.com. If you are still having lice problems, read the latest chapter from *The Best Control II*© at: www.thebestcontrol2.com.**

Head lice can infest anybody, but children are more prone to infestations because they play closely and share items that come in contact with the head like hats, headphones, and combs. Head lice are not known to transmit any infectious diseases; they are more of a nuisance than a health risk. Children with head lice, however, are generally not allowed to attend school as long as nits are found in their hair.

Head Lice Facts

Head lice cannot hop, fly, or jump; they crawl. Lice spread only through direct contact with an infested object or person.

Head lice spend their entire life in head hair and can only survive off a human head for about 1 or 2 days.

A newly hatched louse must ingest blood within minutes of birth to survive.

Head lice cannot live on family pets

Nits (eggs) that are more than 1/4 inch from the scalp probably are dead or have already hatched.

What to look for:

Intense scratching on the back of the head or neck.

Check any adult with a beard or mustache

Tiny, white eggs (nits) glued to the hair near the scalp.

Small, rapidly crawling flat insects.

Four steps necessary to manage an infestation of head lice:

Use a head louse shampoo if you observe active lice or viable eggs.

Avoid shampoo products containing malathion or lindane, which are available by prescription only. Pyrethrin and permethrin are less polluting to wastewater than lindane. Not all lice and no eggs will be killed.

To avoid insecticide POISONS entirely, use soap shampoos that contain coconut or olive oils. Most soap or salt shampoos kill all stages of the louse except the egg. But, you must be sure to comb and repeat these shampoos four times at 3-day intervals. Successive shampooing kills newly hatched lice.

You can simply use Lice R Gone® Shampoo to normally remove all lice and nits without combing in ten minutes – if you have previously used a pediculicide POISON – leave the Lice R Gone® shampoo on for 30 minutes and then comb.

Remove nits from the head by combing with a specially designed nit comb.

This step is the key to successful control. Repeat daily as long as you find live lice or nits within 1/4 inch of the scalp. Use a metal comb specially designed for removing head lice and their eggs. Combs sold with head lice shampoos are not generally effective. Infested hair can also be cut out with small safety scissors.

Remove lice and nits from the household.

Wash clothing and bedding of the infested person in hot water (at least 140°F) and dry in a hot dryer or have them dry cleaned. Place other items (earphones, bike helmets) in plastic and put in a freezer that is 5°F or lower for at least 10 hours. Clean any object that might have come in contact with the infested person's head (stuffed animals, car seats). Vacuum carpets and upholstery. Pesticide POISON sprays are not recommended.

Clean with Safe Solutions Tweetmint Enzyme Cleaner with Peppermint.

Check heads and remove nits daily until infestation is gone. Follow with weekly head checks to detect any signs of reinfestation.

MICE

Sanitation, which includes good housekeeping practices and proper storage and handling of food materials, feed, and garbage, is often stressed as a method of rodent control. Unfortunately, even the best sanitation will not completely eliminate house mice. It will, however, aid in control by permitting easier detection of mouse sign, increasing effectiveness of traps and baits by reducing competing food items, and by preventing mice from flourishing and reaching high populations. Although house mice are less dependent upon humans for their existence than are Norway rats, they are much more adaptable to living with people. They require very little space and only small amounts of food. Mice have been known to inhabit buildings even before construction has been complete, living off the crumbs and scraps of worker's lunches. In offices, mice may live behind cabinets or furniture and feed on scraps or crumbs from lunches and snacks and on cookies or candy bars kept in desks. In homes, they may find ample food in kitchens, and in the garage they will eat sacked or spilled pet food, grass seed, or insects such as cockroaches.

Thus, no matter how good the sanitation, most buildings in which food is stored, prepared, or consumed will support at least a few mice. For this reason, a constant watch must be kept for mice that may invade the premises. Where possible, store bulk foods in rodent-proof containers or rooms. Stack sacked or boxed foods in orderly rows on pallets in a way that allows for thorough inspection for evidence of mice. In such storage areas, keep stored materials away from walls. A 12-inch (30.5-cm) white band painted on the floor next to the wall serves as a reminder to keep items away from walls. It also will allow you to detect rodent droppings or other signs more easily. **Sweep floors frequently to permit ready detection of fresh droppings.**

When storing foods or feed on pallets, keep in mind that mice can jump up more than 12 inches from a flat surface. They are also good climbers and can walk straight up surfaces such as wood or concrete (unless the surfaces have a slick finish). Mice can live for considerable periods of time within a pallet of feed without coming down to the floor. Regular removal of debris and control of weeds from around structures will reduce the amount of shelter available to rodents. In some instances, a strip of heavy gravel placed adjacent to building foundations or other structures will reduce rodent burrowing at these locations. In any event, keep the perimeter of buildings and other structures clean of weeds and debris (including stacked lumber, firewood, and other stored materials) to

discourage rodent activity and to allow easier detection of rodent sign.

Several human diseases are associated with rodent infestations. Rodents can carry more than 200 human pathogens. Salmonellosis is a serious intestinal disorder that can be transmitted to people who ingest food contaminated by salmonella bacteria in rat urine or feces. Murine typhus, leptospirosis, listeriosis and trichinosis are other rat-transmitted diseases. The tropical rat mite, an external parasite of rats, causes severe itching and skin irritation in people. Rats have occasionally been known to bite sleeping people; these bites can result in an infection known as rat bite fever. Plague bacteria can be transmitted from rats to people through the bite of rat fleas. **Over $120 million is spent in the U. S. alone each year on rodent "control" programs.**

Sanitation: Institute good daily cleaning procedures, food storage and garbage removal. Use 1 - 2 oz. per gallon of water Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and borax (½ cup per gallon of water) to clean and help remove urine, excrement and food particles in all infested or suspect areas on a routine basis. All fiberglass insulation should be removed from around refrigerator and freezer condensers and motors. Keep exterior areas clean, closely mowed and trimmed. Glue traps should be checked daily and any trapped mice removed and disposed of in a dumpster. Live traps should be checked daily and mice drowned in a pail then disposed of in a dumpster. All trash bags should be removed as soon as possible. Doubled trash bags should be used to prevent leakage. Also, it is important that both of these bags be securely tied shut to prevent leakage into the dumpster. Dumpsters should be cleaned with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint and/or borax (at the above-mentioned rates) twice per month in winter and weekly in summer to remove any food residue. All equipment, floors and walls also need to be routinely sanitized to remove food residue and mouse urine and/or excrement.

Exclusion: All gaps around plumbing pipes and holes in walls and floors should be repaired or at least plugged with steel wool and/or aerosol foam insulation. Remove all exterior debris.

Eating Areas: All eating must be in clearly designated areas only so that custodial staff can ensure it is cleaned up.

Food Storage: It is extremely important that all food (and garbage) be properly stored in heavy duty plastic, glass or metal containers. Items such as noodles, flour and grain products that are open must be stored in these containers to prevent contamination. Storage pallets must be 18+" away from walls so inspections can be made. **Please remember that proper sanitation, exclusion**

and food storage are the key elements to successfully combating any rodent problems. Trapping or baits will not eliminate the reason for the mice being present anywhere.

Set live multiple catch traps or glue boards baited with a Cheerio or little piece of cookie wherever you see any droppings. Trapping can be an effective method of controlling mice, but it requires more labor than most other methods. Trapping is recommended where poisons seem inadvisable. It is the preferred method to try first in homes, garages, and other small structures where there may be only a few mice present. Trapping has several advantages: (1) it does not rely on inherently hazardous rodenticides; (2) it permits the user to view his or her success; and (3) it allows for disposal of the mice, thereby eliminating odor problems from decomposing carcasses that may remain when poisoning is done within buildings. The simple, inexpensive, wood-based snap trap is available in most hardware and farm supply stores. Traps should be baited with a small piece of nutmeat, chocolate candy, dried fruit, or bacon tied securely to the trigger. Peanut butter or marshmallows also may be used as bait. Because mice are always in search of nesting materials, a small cotton ball will also work as a bait when attached securely to the trigger. Food baits that become stale lose their effectiveness. Set traps close to walls, behind objects, in dark places, and in locations where mouse activity is seen. Place the traps so that when mice follow their natural course of travel (usually close to a wall) they will pass directly over the trigger. Set traps so that the trigger is sensitive and will spring easily. Effectiveness can be increased by enlarging the trigger. Attach a square of cardboard, metal, or screen wire that fits just inside the wire deadfall. Use enough traps to make the campaign short and decisive. Mice seldom venture far from their shelter and food supply, so traps should be spaced no more than about 6 feet apart in areas where mice are active. Although mice are not nearly as afraid of new objects as rats are, leaving the traps baited but unset until the bait is taken at least once will reduce the chance of mice escaping the trap and becoming trap-shy.

Multiple-capture (automatic) mouse traps such as the Ketch-All® and Victor Tin Cat® are available from some hardware and farm supply stores as well as from pest control equipment distributors. These traps work on the principle that mice enter small holes without hesitation. The Ketch-All® has a wind-up spring that powers a rotating mechanism. When triggered, the mechanism entraps mice in a holding compartment. The Tin Cat® has one-way doors that mice cannot exit. Such traps may catch many mice in a single setting, but should be checked and emptied periodically so that mice do not die of

starvation or exposure in the traps. Various types of box-type traps (Sherman-type and others) that capture one mouse at a setting are used primarily for research purposes. The desire to “build a better mousetrap” keeps a variety of traps of variable effectiveness coming and going on the retail market. Keep traps reasonably clean and in good working condition. They can be cleaned with a hot detergent solution and a stiff brush. Human and dead-mouse odors on traps are not known to reduce trapping success. An alternative to traps are glue boards, which catch and hold mice attempting to cross them, much the way flypaper catches flies. Place glue boards wherever mice travel—along walls or in established runways. Do not use glue boards where children, pets, or desirable wildlife can contact them. Glue boards lose their effectiveness in dusty areas unless covered, and temperature extremes may affect the tackiness of some glues. They are considered less effective for capturing rats than for mice. Glue boards can be purchased ready-to-use, or they can be made.

Other Rodents Controls: Make the Author’s "Walk-the-Plank®" trap by putting 7" of water in the bottom of a 5- gallon pail covered with a 3" of floating oats or sunflower seeds and a yard stick or board up to the rim. Please see: www.youtube.com/watch?v=AG1CDiLcznc. For rats, use a garbage can filled 2/3's with water and covered with oats or other floating foodstuffs. Beer, e.g., Bud Light, or Pepsi that still has its "fizz" will kill rats and other rodents that drink it. (They can not get rid of the gas.) Mice and voles die when fed baits with vitamin D. Dried pea diets will sterilize mice.

Repellants: Peppermint will often repel mice, so routinely clean with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint.

Outside - "Fumigate" active burrows with carbon dioxide or carbon monoxide. (You can use lit charcoal briquettes to create the carbon monoxide. You can use dry ice or a cylinder of CO_2 to create the carbon dioxide.) House mice are well adapted to living in close contact with humans and thrive where food and shelter are abundant. They eat and contaminate food supplies and also can transmit disease. Their gnawing activities can damage structures or property. **Manage them by cleaning up debris, removing food and shelter, eliminating entryways into buildings, or using traps or baits. High frequency electronic devices aren’t effective.**

How to detect a house mouse infestation:

Look for droppings, fresh gnaw marks, and tracks, which indicate areas where mice are active.

Search behind boxes, in drawers, in garages, or around woodpiles for nests made

of finely shredded paper or other fibrous material.

Check for the musky odor associated with mice.

Mice are most active at night, but you also can see them during daylight hours.

Discourage mice by removing food, water, and shelter and sealing entryways.

Good housekeeping within buildings reduces shelter and food for house mice.

Seal all structural cracks and openings larger than 1⁄4 inch. Use wire screen or coarse steel wool that mice can't chew through.

Ensure all doors, windows, and screens fit tightly.

Feed pets only the amount of food they will eat at a single feeding.

Keep all food storage and garbage containers sealed.

Thin or remove plants next to or climbing up buildings, since house mice are excellent climbers.

Remove mice from your home by trapping.

Snap traps and glue boards are the safest and most economical traps.

Place traps in secluded areas along walls, behind objects, in dark corners, and in places where droppings have been found.

Dispose of dead rodents by burying or placing them in plastic bags and putting them in the garbage. Don't touch mice with your bare hands, and wash hands thoroughly after handling traps.

What about poison baits?

Avoid using baits indoors. Mice can die in hidden places, create bad odors, and be difficult to locate. Seal buildings before baiting outdoors to prevent mice coming indoors to die.

Baits generally take several days for effective control.

Place baits in tamper-proof bait stations out of reach of children and pets. **All rodenticide baits are toxic.**

The Author uses aspartame to kill mice, they will normally eat it for up to four days and then die usually without any odor because aspartame metabolizes into formaldehyde! Which reminds the Author of a dead mice joke:

A cat dies and goes to Heaven. G-d meets him at the gate and says, "You have been a good cat all of these years. Anything you desire is yours, all you have to

do is ask." The cat says, "Well, I lived all my life with a poor family on a farm and had to sleep on hardwood floors." G-d says, "Say no more." And instantly, a fluffy pillow appears.

A few days later, 6 mice are killed in a tragic accident and they go to Heaven. G-d meets them at the gate with the same offer that He made the cat. The mice said, "All our lives we've had to run. Cats, dogs and even women with brooms have chased us. If we could only have a pair of roller skates, we wouldn't have to run anymore." G-d says, "Say no more." And instantly, each mouse is fitted with a beautiful pair of tiny roller skates.

About a week later, G-d decides to check and see how the cat is doing. The cat is sound asleep on his new pillow. G-d gently wakes him and asks, "How are you doing? Are you happy here?" The cat yawns and stretches and says, "Oh, I've never been happier in my life. And those Meals on Wheels you've been sending over are the best!"

MISTLETOE

It is unlikely that mistletoe kills trees directly, but tree branches may die as a result of mistletoe infection. Effective control of mistletoe is difficult to achieve. Mistletoe is a parasitic plant that absorbs both water and nutrients from a host tree. Healthy trees can tolerate a few mistletoe branch infections. However, if the infestation is severe, trees can weaken, have stunted growth or dead branches, or die completely. Symptoms are magnified on trees already stressed by drought or disease. Remove branches at least a foot below the mistletoe attachment, before it produces seeds that will infest other limbs and trees. Types of mistletoe—broadleaf and dwarf: Broadleaf mistletoes attack broadleaf trees and some conifers. Plants have green stems with thick, almost oval-shaped leaves and produce small, sticky, whitish berries in fall. Birds disperse the seeds. Dwarf mistletoes attack conifers. Plants are smaller with short stems and yellow to orange scaly leaves, resembling a juniper. Seeds mature in midsummer to late autumn and eject from the plant, traveling up to 50 feet. Mistletoe infestations weaken trees. Tree injury varies according to mistletoe and tree species. Dwarf mistletoes tend to be more damaging. Healthy oaks in natural areas can tolerate some mistletoe, but branches are more likely to break. Severely infested trees show reduced vigor, stunted

growth, swellings on branches, and dead branches; some trees die completely. Drought or disease can magnify symptoms. Dwarf mistletoes cause profuse branching, or witches' brooms, on conifers. Dead and dying limbs are a significant fire danger, especially in forested areas.

If possible, select resistant tree species. Mistletoe rarely infests Bradford flowering pear, Chinese pistache, crape myrtle, eucalyptus, ginkgo, golden rain tree, liquidambar, sycamore, cedar, or redwood. Avoid especially susceptible varieties such as alder, Aristocrat flowering pear, and Modesto ash. Diversify infested conifer stands by replanting with different nonsusceptible species. Most dwarf mistletoes attack only one or a few related pine family species. Prune out mistletoe as soon as it appears. For good control, remove branches at least 1 foot below the point of mistletoe attachment. Simply cutting off mistletoe from trees can reduce spread, but it won't provide total control. If it's not possible to remove the infested trunk or a major branch, prune off the mistletoe and wrap the infested area of the tree with sturdy black polyethylene plastic secured with twine or tape to exclude light. Leave on for up to two years until the mistletoe dies, replacing any plastic that becomes torn. Remove trees that are too severely infested to prune back. Although plant growth regulators temporarily remove mistletoe, these chemicals provide only short-term control and don't kill mistletoe plants. A community

effort is the best defense. Since mistletoe spreads easily from one tree to another across property lines, removing mistletoe from all trees on the street will have the greatest benefit. Because it is so easy to damage the host tree and other nearby plants, using a herbicide is not recommended. So, what do you do with mistletoe? It’s a Christmas tradition. A man has the privilege of kissing a lady who happens to be standing under a sprig of mistletoe, a plant that is said to symbolize peace and love. You might as well enjoy it, because you probably won’t be able to successfully eliminate it from your trees. Try to get your sweetheart to stand with you under a mistletoe-infected tree, and steal a kiss!

MITES (SPIDER AND CLOVER)

Try companion plantings of alder, coriander, or dill, and use rye mulch and wheat mulch. Or spray them with diluted Safe Solutions Tweetmint Enzyme Cleaner with Peppermint.

MOLDS-FUNGI-MILDEW

Mold can grow almost anywhere there is water, high humidity or dampness. When mold spores land on a damp spot they begin growing and digesting whatever they are growing on in order to survive. This digestion process, if unchecked, will eventually damage and then destroy the organic material the mold is feeding on. The way to control indoor mold growth is to control moisture. Removing the source of moisture — through repairs or dehumidification — is critical to preventing mold growth. Molds are fungi that are found everywhere – both indoors and outdoors all year round. The terms fungi and mold are often used interchangeably, but mold is actually a type of fungi. Concern about indoor exposure to mold has increased along with public awareness that exposure to mold can cause a variety of adverse health effects. There are many thousands of species of mold and most if not all of the mold found indoors comes from outdoor sources. Mold seems likely to grow and become a problem only when there is water damage, high humidity, or dampness. Molds produce and release millions of spores small enough to be air-, water-, or insect-borne. They can also produce toxic agents known as mycotoxins. Spores and mycotoxins can have negative effects on human health. For those people who are affected by mold exposures there can be a wide variation in how they react. People at

greatest risk of health effects are individuals with allergies, asthma, sinusitis, or other respiratory conditions, as well as infants and children, elderly people, and pregnant women. In addition, individuals with a weakened immune system are at risk.

Mold is one type of fungi which include yeasts, mildews and molds. All fungi require external food sources and normally high moisture levels to develop. Allergies can cost up to $2 billion yearly in medical costs, prescriptions and decreased productivity - up to 10 million work days are missed each year and every day allergies keep at least 10,000 kids out of school! The number of allergy sufferers has soared in the last 20 years as more and more contaminants fill the air, water and food. High levels of mold and/or fungi, e.g., Aspergillus versicolor can create many health problems, especially if a person has allergies; symptoms can be itching, eye irritation, vomiting, diarrhea, breathing problems, a sore throat, runny nose, headaches, congestion, and even life-threatening collapse from anaphylaxis. Stachybotrys chartarum (or atra) is a greenish-black mold that can grow on high cellulose materials with low nitrogen content. It needs constant high moisture to survive. This mold can congestion, fever and eye irritation. cause nasal problems.

Sometimes volatile organic compounds (VOC's) are

created and residents can really get sick. At every school where the Author had the custodians mist the area and clean the ducts with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint at 1 oz. per quart and mop with and clean all surfaces and ducts with 1 oz. per gallon and/or rinse-and-vac with 2 oz. per gallon, we have controlled the allergy symptoms for at least 30 days with only Safe Solutions, Inc. Enzyme Cleaner with Peppermint. Routine cleaning with Safe Solutions, Inc. Enzyme Cleaner with Peppermint and/or borax or baking soda should quickly control or eliminate any and all fungi and mold problems, especially if you repair all leaking roofs, walls, plumbing and other moisture problems.

Dry out basements and bathrooms/showers - prime breeding areas for fungal spores. Don't use humidifiers, or if you must, only use them with 1/3 oz. of diluted enzyme cleaner per gallon of water. Properly install and maintain dehumidifiers. Circulate air in bathrooms with exhaust fans. Install and maintain (activated charcoal) filters in all ducts in central air conditioning and heating systems. Treat all wet wood and/or cellulose materials you want to save with TIM-BOR® per label directions and mop all floors, etc. with Mop-Up® per label directions or, if you do not have access to these products, use 1½ cups of borax or even 1 cup of baking soda per gallon of hot water; be careful not to put any boron product where it can be ingested. To quickly bring the

allergic reactions down , simply mist or spray the room with Safe Solutions, Inc. Enzyme Cleaner with Peppermint enzymes and then install the activated charcoal filters on both sides of a box window fan; then turn the fan on and filter the air...or you can buy a high-efficiency air cleaner. Replace the filters as needed. Clean routinely with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or baking soda or borax.

5% vinegar will kill 82% of all molds.

Sodium borate, borax, salt and lime will kill all mold, but they also may kill plants.

Zinc strips and/or bare copper wires have been used to help control mold.

Baking soda, food-grade DE and diluted enzyme cleaner will all kill mold. After applying you can help by gently brushing or sweeping the molds away.

The proper use of dehumidifiers, vents, fans and/or air conditioners can greatly reduce the amount of mold problems you may have.

As a last resort, use 1 cup of bleach per gallon of water to temporarily control mold.

Note: Twenty-five states, Puerto Rico and the Virgin Islands have OSHA-approved State Plans and have adopted their own mold standards and enforcement

policies. For the most part, these States adopt standards that are identical to Federal OSHA. However, some States have adopted different standards applicable to this topic or may have different enforcement policies.

MOSQUITOES

The world's most dangerous creature may come as a surprise to some readers - it is the tiny, little mosquito. Always remember that only the female mosquito sucks blood, which she only needs to lay her eggs, because she and the males both feed on plant sugars for energy. When a female mosquito bites, she also injects saliva and anti-coagulants into your blood which can also contain disease-causing viruses or other parasites which can be transferred from animal-to-animal, animal-to-person, or person-to-person, without the insects catching the disease themselves. Mosquitoes are known to carry many infectious diseases from microorganisms, e.g., viruses and parasites. Viruses carried by arthropods such as mosquitoes are known collectively as arboviruses. Mosquito-borne illnesses include Malaria, West Nile Virus, Elephantiasis, Dengue Fever, Yellow Fever, etc. The malaria parasite (plasmodium) is transmitted by female Anopheles mosquitoes. The term malaria is derived from the Italian 'mal-aria" or "bad air" because it was incorrectly thought to come on the wind from swamps and rivers.

Female mosquitoes are estimated to transmit diseases to more than 700 million people annually with millions of these infections resulting in death. Mosquitoes are blood-feeding ectoparasites of people and animals. The English

call mosquitoes "gnats". There are about 100 trillion mosquitoes with at least 3,450 different species in the world. They are found from the tropics to the Arctic regions. All of the families belong to the order Diptera and are related to house flies, gnats and midges. What makes mosquitoes different from all other flies is the presence of a long, piercing mouthpart called a proboscis and the scales on the hind margins and veins of their wings. Morphologically, mosquito males differ from females in that they have feathery antennae, long feathery palps and smaller mouthparts. Mosquitoes develop through complete metamorphosis and have four distinct states: egg, larva or "wriggler", pupa or "tumbler" and adult.

Mosquito eggs can be classified into three groups: 1. eggs laid singly on the still or very slow-moving water surface (Anopheles), with each egg having a series of "floats" along its perimeter; 2. eggs laid in groups forming rafts made by the adult females that float on water surfaces (Culex and Culiseta); and 3. eggs laid singly out of the water in the mud (Aedes and Psorophora). Mosquito larvae are aquatic; they feed on water mites, water fleas, algae, protozoans and minute organic debris by sweeping the food into their mouths with a pair of feeding brushes. Mosquito pupae also live in the water. Adult mosquitoes are small, about 1/8" long, with a single pair of membranous wings and are free living. A typical

mosquito only weights about 2.5 milligrams, or about 20,000 mosquitoes per pound. Females of most species require a human and/or animal blood meal before oviposition, utilizing the protein in blood to produce their eggs and bring them to maturity. There are an estimated 10 trillion mosquitoes produced just in the U. S. each summer with about 170 species. To give you some idea how many 10 trillion is - that amounts to 41,000 mosquitoes for every man, woman and child or enough to fill the entire Grand Canyon! A mosquito's brain is the size of the period at the end of this sentence, yet it has outwitted man's "controls" since the dawn of recorded history! It still can not find a way to fly into a 3 mph wind, however.

Mosquitoes seriously harm vast numbers of people worldwide by transmitting pathogenic organisms that cause disease and death, especially in tropical areas. Including Eastern, Western, California and St. Louis encephalitis, heartworm, malaria, yellow fever, dengue and filariasis. Malaria is a constant threat even in the United States where known vectors exist. Malaria, among all insect-borne diseases, has been the most deadly in modern history. During the last century alone it had killed between 100 - 300 million people, mostly babies and small kids and it infects and debilitates hundreds of millions of others each year per WHO! CNN Trivia 2/4/98 noted that 700,000,000 people a year are infected

by diseases carried by mosquitoes. In comparison, only 21 million people died in combat in World War I, World War II and the Korean War combined.

Over 60 species of Anopheles mosquitoes are known to be capable of transmitting malaria. Travelers returning from abroad can constantly introduce the causal agents of malaria, which are microscopic protozoa in the genus Plasmodium spp. On average, one person dies every 30 seconds as a result of a little mosquito "bite". In Canada hordes of mosquitoes can actually darken the sky - researchers were bitten about 9,000 times per minute; at that rate they could lose 1/2 their blood in 2 hours and die from blood loss! But our primary reason for controlling mosquitoes usually is only to lessen the annoyance caused by their bites and then only secondarily to reduce the transmission of human and equine viral encephalitis and dog heartworm. What is the West Nile virus? West Nile Virus is spread by mosquitoes that get the virus from infected birds. Once infected, mosquitoes then transfer the virus to humans and other animals. Infected humans can become ill. The disease usually is most serious in children, people with weakened immune systems, and the elderly.

The best defense is to avoid mosquito bites! Be sure doors and windows are properly screened. Avoid being outdoors at times of the day when mosquito activity is

high in your area, especially at dawn and dusk. Wear long-sleeved shirts, long trousers, socks, and a hat if you must be outside when mosquitoes are present. Insect repellents containing the pesticides DEET and picardin repel maybe effective, but adults have experienced memory loss, headache, weakness, fatigue, muscle and joint pain, tremors and shortness of breath after using DEET. Children are apt to have subtle brain changes because their skin readily absorbs any/all chemicals. Never use DEET on an infant or a pregnant woman. Be sure to wash your hands after application to avoid ingesting the pesticide POISON. Oil of Lemon Eucalyptus (PMD) and repellents containing herbal ingredients are less effective, so you must frequently reapply them. Any repellant containing the herb pennyroyal should not be used by a pregnant woman.. Outdoor insecticide POISON sprays can temporarily reduce the number of adult mosquitoes but have no lasting effect.

The annoyance caused by mosquito feeding can include the itching, restlessness, loss of sleep and nervous irritation in all people, pets and domestic animals that suffer from their attacks. Mosquitoes do not really "bite", but they penetrate their victim's hide or skin with their proboscis or hollow, flexible snout. The female has a pump in her head which she uses like a turkey baster to suck in your blood. The average meal takes about 1

millionth of a gallon per bite. Her saliva makes us itch. Usually this minor annoyance can not be documented in terms of economic loss, but, obviously, there may be some major economic losses, e.g., decreased recreation income and lower milk and beef production due to blood loss and irritation. Occasionally extremely large numbers of mosquitoes can actually cause the death of domestic animals through blood loss and anaphylactic shock from reactions to mass injections of mosquito saliva. Mosquitoes are not strong fliers - so fans easily blow them away. The reproductive success of mosquitoes depends in a large part on the ability of gravid females to locate and select oviposition sites that will support the growth development of their offspring. Safe Solutions, Inc. Enzyme Cleaner with Peppermint diluted in water (1 part per 50,000 parts of water) create an adverse environmental condition that renders the water repellent and/or lethal to all stages of growth. Decrease your chances of getting bitten by reducing standing water around your home, using repellents, and wearing protective clothing when outdoors. Minimize mosquito-friendly habitats. Empty water from unused garden pots and other objects. Store containers upside down or cover or dispose of them, so mosquitoes can’t lay eggs. Change water in pet dishes, watering troughs, and bird baths at least weekly. Avoid overwatering, which can lead to standing water. Keep litter and garden debris out of street

gutters. Clean rain gutters and downspouts at least once a year to remove debris. Seal rain barrels, so mosquitoes can’t breed in them. Keep all filters and prefilters clean and free of moisture-retaining debris and inspect regularly for leaks. For ponds, remove excess vegetation, stock with fish, or use Bacillus thuringiensis (Bt) products such as Mosquito Dunks, Plunks, or Bits, which contain a bacterial agent that kills mosquito larvae but doesn’t affect people, other animals, or plants. Maintain water quality in swimming pools with chemical treatments. Keep water off swimming pool covers. Cover or drain water from plastic pools when not in use, so mosquitoes can’t lay eggs in them. Fill open tree holes with sand or mortar.

Maintain tight screens and weather-stripping. Use sodium vapor lamps or yellow non-attractive light bulbs at outside entrances. Remove or empty frequently any containers that may hold rainwater (flower pots, tires, cans). Clean out clogged roof gutters holding stagnant water. As a last resort, add light-weight oil to surfaces of ponds, ditches and even animal hoof prints in mud where mosquitoes may breed. Community effort is needed. Try the proper, professional use of entomopathogenic bacteria, e.g., Bacillus thuringiensis strains (Bt) or Bacillus sphaericus (Neide) (Bs), another important pathogen of mosquitoes, diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint, dehumidifiers and/or

fans and other Intelligent Pest Management® controls before spraying any volatile, synthetic pesticide poisons.

Remove all sources of stagnant or standing water if possible, e.g., old tires, bird baths, cans, trash barrels, wading pools, etc., or add Safe Solutions, Inc. Tweetmint. Enzyme Cleaner with Peppermint, at a rate of 1/3 oz. per gallon of water.

Spray the area and drains with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per quart of water). Remove or spray bushes and dense shrubbery and vines by doors and patios with hose end sprayers and enzymes (1 - 2 oz. per gallon of water).

Turn on fans to “blow them away.” Sit in the breeze (even if it is from a fan). They will not bother you.

Mosquito bite relief: Soak bites in Epsom salt water or apply a paste of salt mixed into lard or cold cream.

Lighting fogging or spraying diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (2 oz. per gallon) or garlic oil will control mosquitoes immediately.

Rub citronella oil or scented geraniums on clothing or exposed areas or burn citronella candles or wash yourself, your pet and your clothes with Safe Solutions, Inc. Enzyme Cleaner with Peppermint.

Pennyroyal, rubbed on the skin (if you are not sensitive), tansy or scented geraniums planted near a door, or basil

plants will repel mosquitoes. Wear protective clothing or vinegar on the skin. CNN 8/28/01: Iowa State says catnip is 10x more effect than DEET, so a very small amount of catnip oil can be a very effective mosquito repellant.

Practice proper exclusion; repair 16 to 18 mesh screens; seal windows and doors and caulk.

Caution - Test anything you want to put on your skin only on a small area first.

Some people are more attractive to mosquitoes than others. Mosquitoes are attracted to dark clothing, carbon dioxide and sweat. Prime feeding times are late dusk and early evening. Some people react more seriously to mosquito saliva, the chemical that causes the bites to swell and itch. Carry a small “spritzer” bottle filled with very diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint, apply and rub into to bite area - this normally will reduce the swelling and itching.

Introduce some dragonflies to your wetlands, ponds, lakes or even swamps to eat up these little vampires!

How to make an attractive Toxic Sugar Mosquito Baits: To lay eggs, females do need blood for its iron and protein. But usually mosquitoes subsist on modest sips of nectar from flowers or from ripe or rotting fruit. And that, according to scientists from Hebrew University in Jerusalem, is an... Achilles’ proboscis - through which the pests can also be poisoned... That’s how we came up with

fruit juice...Attractive Toxic Sugar Baits... “You can’t move flowering trees around,” said Yosef Schlein, a parasitologist at the University’s medical school. “So you have to use movable bait. That’s how we came up with fruit juice.”

Supported by a grant from the Bill and Melinda Gates Foundation, Dr. Schlein and his research partner Günter C. Müller concocted an array of nectar poisons known as Attractive Toxic Sugar Baits that are easy to make, environmentally friendly and inexpensive. In tests in Israel and in West Africa, the baits knocked down mosquito populations by 90 percent. Even better, they nearly eliminated older females, the most dangerous mosquitoes. (Only females bite humans, and only mosquitoes that have already picked up malaria, dengue or another disease from one human can inject it with their saliva into another human.) Dr. Müller and Dr. Schlein tested their idea five years ago at a desert oasis near the Red Sea. Putting out vases of flowering tree branches, they learned that acacias — the thorn trees common in Africa — attracted the most mosquitoes. They sprayed branches with a mixture of sugar water and Spinosad, a bacterial insecticide considered harmless to humans and most beneficial insects. The mosquitoes feeding on them died. Their next test was in a Greek Orthodox monastery in the Judean hills where mosquitoes laid their eggs in underground rainwater storage cisterns. They filled old

soda bottles with a solution of brown sugar, the juice of rotting nectarines, Spinosad and a dye. They put each in a sock with a wick that helped keep the sock soaked with the colorful fatal elixir. They suspended a bait at the opening of each cistern. Trapping later showed that up to 97 percent of all mosquitoes in the area were marked with the dye, meaning they had landed on a toxic sock at least once. Within a week, the female population had crashed to near zero; it stayed there for a month.

The toxic sugar bait developed by scientists at Hebrew University Medical Center in Jerusalem is made with a combination of fruit juice essences, which are attractive to mosquitoes, and boric acid - a mild, inorganic powder that kills insects when they ingest it. In experiments in a semi-arid region of Mali, in West Africa, the bait - in this case a blend of boric acid with guava and honey-melon fragrances - was applied using a hand sprayer on the vegetation near a cluster of man-made ponds. These ponds are important dry-season water supplies for local villagers and their livestock. They are also breeding grounds for Anopheles gambiae, the mosquito that carries the most deadly form of malaria. For comparison, investigators sprayed grasses and leaves near other ponds with a solution of sweet fragrances only. Both baits contained a dye that marked any mosquito making contact, so scientists could count how many had actually fed on the lure. Josef Schlein, a medical entomologist

who led the study, says the results after 38 days showed the bait containing both sweet fragrances and boric acid proved to be very effective at killing mosquitoes.” In Mali, we got down by some 80 percent, the females, and 90 percent of the males,” he said. “But the area is full of little ponds in there, so it is impossible to stop mosquitoes from flying from an untreated pond to a treated pond.” At the control sites that were treated with fragrances only, Schlein says upwards of 75 percent of mosquitoes fed on the fake bait.

Their most recent study, published in Malaria Journal, was done in West Africa, where malaria is a major killer, especially of young children. The scientists chose a rural road in Mali running past ponds where two aggressive mosquito species breed — Anopheles gambiae and Anopheles arabiensis. They sprayed weeds there with a solution of the fermented juice of local guavas and melons mixed with dye and boric acid. Within a few days, they saw 90 percent die off. Boric acid is much less expensive than Spinosad. It is also about as harmless to humans as table salt is. It is a chief ingredient in Silly Putty. Dr. Schlein said he had heard that some Malians sampled the alcoholic bait brew, with no ill effects. But it kills insects that eat it. It is common in cockroach control; when a thin layer is spread on floors, cockroaches take it in when they preen their feet. “You can buy it by the truckload,” Dr. Christensen said. “And it kills in so many

ways that there's never been resistance to it. Some authorities think there never will be." www.malariajournal.com/content/9/1/210.

Schlein explains most people don't realize that female mosquitoes typically feed on sweet plant nectars to survive. Their more familiar blood meals, when mosquitoes bite people, are part of the reproductive cycle. The researchers' goal now is to make a lure that's even more irresistible to mosquitoes. Research leader Josef Schlein notes that boric acid poses little risk to humans and other mammals, so it's possible a mosquito lure could be developed for use indoors. Given the non-toxic simplicity of this new bait, the Hebrew University entomologist says it's a marvel that other scientists didn't think of it sooner. BUT, The Author did think of and write about these baits sooner..

The Author wants to add at this point that he had previously noted (over 10 years ago) that adding a toxin like aspartame to fruit juice or a sugar-spiked solution would kill both male and female mosquitoes when used as either a bait or spray. Laboratory tests showed that a mixture of 1% boric acid in just plain sugar water killed 98% of the test mosquitoes in 48 hours; furthermore, when given a choice between bait with, and without, boric acid, 73% of mosquitoes fed on the former and died within 48 hours. The addition of fermented fruit juice will

attract even more mosquitoes! Boric acid is generally considered safe for humans and other mammals - even so - place your baits where children will not get into them.

The Author also suggests adding some yeast to the above-mentioned sugar baits or the trap mentioned below to make them even more attractive to biting mosquitoes. (See below.)

How to make a great Mosquito trap

Materials Needed: goodguy.hubpages.com/hub/DIY-Mosquito-trap

2000ml (2-liter) bottle

50 gm brown sugar

1 gram (0.035 ounce) yeast

Thermometer

Measuring cup

Knife or sharp scissors

Black paper/Black tape

Instructions:

a. Cut off the top of the bottle where it begins to turn in - so that it can later be inverted to create a funnel into the bottle.

b. Put 200ml (.85 cup) hot water in a separate container, stir with 50gm (1.8 ounces) brown sugar. Wait for water to cool down to 40C or 120F.

c. After cooling down, pour the sugar water into the bottle, then add the yeast. This will activate the yeast to create carbon dioxide, which will attract mosquitoes.

d. Place the top part of the bottle upside down like a funnel and secure with black tape.

e. Cover the surface of the entire bottle with black paper or black tape.

f. Place the trap at a dark corner.

g. Replace the solution every two weeks.

Visit www.youtube.com/watch?v=JAp3Mr2YzN8 for video.

Sabyasachi Sarkar and his team of inorganic chemists at the Bengal Engineering and Science University have now come across a new answer to the mosquito problem. When trying to take pictures of zebrafish, that had been fed on mosquitos treated with water-soluble carbon nanoparticles (wsCNPs) to help with the imaging, they noticed that the presence of the wsCNPs appeared to be retarding the development of the mosquito larvae. After further investigation, Sarkar and his team were able to show that a concentration of these wsCNPs as low as 3mg/l prevents the larvae from ever reaching maturity, resulting in their death. At this concentration, the wsCNPs are otherwise harmless to the surrounding environment and can persist in stagnant pools of water for periods of several months. The nanoparticles are made by burning wood wool in a reduced oxygen environment, washing them and then treating them with nitric acid. ‘It is an easily scalable process,’ says Sarkar, ‘the mosquito eradication programs run by different government agencies across the globe should try this method, particularly in cities with poor drainage.’ ‘It's very positive that the wsCNPs exhibit a high persistence

in water and the local environment, as opposed to other synthetic insecticides that can quickly degrade,’ says Pilar Mateo, a leading specialist in the control of endemic disease transmitting vectors and President of Inesfly Corporation.

BITING MIDGES

The Culicoides furens, is the scientific name for what we call no-see-ums, sand fleas, sand gnats, sand flies. Their official common name is the biting midge. Key word: biting. Native Americans paddled a mile offshore so they could sleep at night. Like Mosquitoes the biting midges feed on flowers, getting an itty, bitty sugar high to power their clear wings and three pairs of legs. Only the female biting midges bite, to get the blood protein she needs to develop eggs. Biting midges do not usually venture more than three miles from their marsh home. They're worse at twilight and dusk and they are attracted to black. Run a fan on the deck when you entertain because no-see-ums don't like the wind. Make some fruit juice baits with either 5% aspartame or 2% boric acid and place these baits wherever you see them in order to kill them all.

OCCASIONAL INVADERS (BOX ELDER BUGS, ELM BEETLES, ETC.)

Occasional invaders, a group of insects that invade structures from time to time, often find their way inside homes throughout the year when weather conditions become hostile to their survival. These pests include box elder bugs, centipedes, earwigs, house crickets, ladybugs, millipedes, pillbugs, silverfish, springtails and stink bugs, to name a few. Occasional invaders usually enter the home through exterior cracks or openings in search of food, water and shelter. Once inside, these pests can’t survive for long periods of time if water is not available. Unless a significant amount of moisture is present, occasional invaders are likely to die within a few weeks. While the majority of these pests do not pose serious health threats, it’s still important for homeowners to take precautionary measures to prevent them from coming inside. Here are some simple steps that homeowners can take right now to prevent occasional invaders from infesting their home:

1. Seal cracks and repair damages: Occasional invader control should begin outside by sealing cracks around windows, doors, siding, utility pipes and underneath wood fascia with a good quality silicone-latex caulk. Damaged screens on doors and windows should also be repaired or replaced. Don’t forget to check for torn

weather-stripping and loose mortar.

2. Reduce moisture sites and properly ventilate: Reduce or, if possible, eliminate all moist harborage sites inside the home – specifically in basements, attics, garages and crawlspaces – because the majority of occasional invaders are attracted to moisture. Check for leaky water pipes under sinks, ensure drains are not clogged and look for signs of moldy wood. If there is any evidence of moisture buildup, install a dehumidifier.

3. Landscape: Another key to controlling occasional invaders is the removal of debris around the exterior of the home such as mulch, leaves, grass clippings, stones and boards, as some of these pests are often associated with vegetation. Frequently closely mow and edge the lawn, and weed plant beds so the home is properly landscaped. Moreover, make sure to store firewood at least 20 feet away from the house and five inches off the ground

4. Change bright lighting: Some occasional invaders such as stink bugs and weevils are attracted to bright lights, so it is recommended that homeowners change outdoor lighting to yellow bulbs or sodium vapor lamps, both of which are less attractive to pests. Inside, windows should be shaded with blinds and curtains so significant light is not visible from the outside.

5. Remove them all with a vacuum: If occasional

invaders enter the home, temporary but immediate relief can be achieved by using a shop-type vacuum to aid in their removal. However, if a vacuum is used to get rid of stink bugs, the bag must be thrown out to prevent the odor from permeating the area.

You can also: Maintain routine and thorough sanitation and proper food and garbage storage. Routinely clean and spray with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint. Steam clean and/or mop the floors with 1 oz. of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or ½ cup borax per gallon of hot water. Don’t allow crawling children or pets to contact borax on the floors.

Lightly sprinkle talcum or medicated body powder, baking soda, a little lime, or ground calcium chloride (Comet® or finely ground Tums®) or food-grade DE inside and outside. Be sure to eliminate all moisture and plumbing problems, and reservoirs hiding/breeding areas). Install and properly maintain vents, air conditioners, dehumidifiers and/or fans. Spray infested plants with diluted (Lemon Joy®) dish detergent (1 oz. per quart of water) or diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (¼ oz. per gallon of water). Be sure you will not burn the infested plants with your diluted sprays by spraying on a few leaves first and then waiting several hours to see what

happens. Most insect pests die quickly when sprayed with 1 oz. Lemon Joy® dish soap and 1 teaspoon of oil per quart of water. This is the same "dishwater" the Author's Grandmother used to control her pest problems. The Author removed virtually all pests inside and outside in over 380 schools simply by using vacuums and/or Safe Solutions food-grade diatomaceous earth (DE) and their Tweetmint Enzyme Cleaner with Peppermint.

PSYLLIDS

Psyllids are aphid-like insects that secrete sticky honeydew. Some species produce white wax, distort leaves and shoots, stunt plant growth, or cause defoliation. Management includes providing proper plant care, conserving psyllid natural enemies, and applying Safe Solutions Tweetmint Enzyme Cleaner with Peppermint when needed. Most plants can tolerate low to moderate numbers of psyllids. Plants commonly affected include: Acacia, boxwood, eucalyptus, eugenia, pepper tree, and some other ornamentals. Pear, potato, and tomato. Damage resembles that from some aphids, scale insects, and whiteflies. Look for: Abundant sticky honeydew that psyllids excrete as they suck plant sap. Black sooty mold growing on the honeydew. Curly or powdery wax or, in certain species, crystallized covers called “lerps.” Distorted or galled leaves or shoots or prematurely dropping foliage. Learn to recognize psyllids. Adults are 1⁄10 to 1⁄5 inch long and hold their wings roof-like over their bodies. Adults are quite active, often jumping away when disturbed. Nymphs are flattened and oblong to round. Some can move, but pit-making species don’t. Nymphs of several species that feed on eucalyptus are hidden under hardened covers (lerps). To reduce problems, use an integrated pest control program. Provide plants with appropriate

environmental conditions and cultural care, especially proper irrigation; conditions vary for each location and plant species. Choose plant species or cultivars that psyllids don’t infest or that are less susceptible to these pests, such as certain acacia and eucalyptus. Learn how to recognize and conserve psyllid parasites and predators. Certain psyllids can be controlled biologically unless natural enemies are disrupted. Avoid stimulating succulent growth. Especially avoid fertilization and unnecessary pruning. For topiary eugenia, shear growing tips about every three weeks and leave the clippings as mulch on the ground for at least three weeks to allow parasites to emerge. Avoid insecticide POISONS that injure natural enemies. Common psyllid natural enemies include lady beetles, pirate bugs, and parasitic wasps. The options currently available for psyllid control are:

direct control, which involves the use of physical control measures.

biological control, concerns the actions of indigenous predators such as birds, various insects, spiders, mites and fungi in limiting pest populations.

cultural control, applies to the tending and caring of trees to encourage healthy growth thus enabling them to be better able to withstand and recover from damaging attacks.

genetic control, involves the selection of genetically

resistant genotypes for use in plantings as well as the genetic manipulation of biological control agents to increase their efficacy against the target pest

If you must treat, select insecticidal soaps, oils, and other least-toxic products. Here again, the Author believes that one of the simplest and most effective controls is a solution of (1 oz. per 2 quarts) Safe Solutions Tweetmint Enzyme Cleaner and water.

RABBITS

Carefully and lightly spread chili (or better yet finely ground Ghost) pepper around plants (it must be reapplied when it gets wet). Install oven racks around plants. Rabbits tend to dislike their texture and the way that they feel on their feet. Other natural rabbit repellants include bellflowers, astilbes, asters, yarrows, cranesbills, hostas, lavender, sage, and other textured or thorny plants. Hunters will be happy to remove them for you during Hunting Season.

RATS

Several human diseases are associated with rat/rodent infestations. Rats/rodents can carry more than 200 human pathogens. Salmonellosis is a serious intestinal disorder that can be transmitted to people who ingest food contaminated by salmonella bacteria in rat urine or feces. Murine typhus, leptospirosis, listeriosis and trichinosis are other rat-transmitted diseases. The tropical rat mite, an external parasite of rats, causes severe itching and skin irritation in people. Rats have occasionally been known to bite sleeping people; these bites can result in an infection known as rat bite fever. Plague bacteria can still be transmitted from rats to people through the bite of rat fleas. In the early 1330s an outbreak of deadly bubonic plague (the black death) occurred in China. The bubonic plague mainly affects rodents, but fleas can transmit the disease to people. Once people are infected, they infect others very rapidly. Plague causes fever and a painful swelling of the lymph glands called buboes, which is how it gets its name.

The Plague also causes spots on the skin that are red at first and then turn black. Since China was one of the busiest of the world's trading nations, it was only a matter of time before the outbreak of plague in China spread to western Asia and Europe. In October of 1347, several Italian merchant ships returned from a trip to the Black

Sea, one of the key links in trade with China. When the ships docked in Sicily, many of those on board were already dying of plague. Within days the disease spread to the city and the surrounding countryside. An eyewitness tells what happened: "Realizing what a deadly disaster had come to them, the people quickly drove the Italians from their city. But the disease remained, and soon death was everywhere. Fathers abandoned their sick sons. Lawyers refused to come and make out wills for the dying. Friars and nuns were left to care for the sick, and monasteries and convents were soon deserted, as they were stricken, too. Bodies were left in empty houses, and there was no one to give them a Christian burial." The disease struck and killed people with terrible speed. The Italian writer Boccaccio said its victims often "ate lunch with their friends and dinner with their ancestors in paradise." By the following August, the plague had spread as far north as England, where people called it "The Black Death" because of the black spots it produced on the skin. A terrible killer was loose across Europe, and Medieval medicine had nothing to combat it. In winter the disease seemed to disappear, but only because fleas--which were now helping to carry it from person to person--are dormant then. Each spring, the plague attacked again, killing new victims. After five years 25 million people were dead--one-third of Europe's people.

Over $120 million is spent in the U. S. alone each year on

rodent “control” programs.

1. Sanitation: Institute good daily cleaning procedures, food storage and garbage removal. Use 1 - 2 oz. per gallon of water Safe Solutions, Inc. Enzyme Cleaner with Peppermint and borax (½ cup per gallon of water) to clean and help remove urine, excrement and food particles in all infested or suspect areas on a routine basis. All fiberglass insulation should be removed from around refrigerator and freezer condensers and motors. Keep exterior areas clean, close mowed and trimmed. Glue traps should be checked daily and any trapped mice removed and disposed of in a dumpster. Live traps should be checked daily and mice drowned in a pail then disposed of in a dumpster. All trash bags should be removed as soon as possible. Doubled trash bags should be used to prevent leakage. Also, it is important that both of these bags be securely tied shut to prevent leakage into the dumpster. Dumpsters should be cleaned with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint and/or borax (at the above-mentioned rates) twice per month in winter and weekly in summer to remove any food residue. All equipment, floors and walls also need to be routinely sanitized to remove food residue and mouse urine and/or excrement.

2. Exclusion: All gaps around plumbing pipes and holes in walls and floors should be repaired or at least plugged

with steel wool and/or aerosol foam insulation. Remove all exterior debris.

3. Eating Areas: All eating must be in clearly designated areas only so that custodial staff can ensure it is cleaned up.

4. Food Storage: It is extremely important that all food (and garbage) be properly stored in heavy duty plastic, glass or metal containers. Items such as noodles, flour and grain products that are open must be stored in these containers to prevent contamination. Storage pallets must be 18+” away from walls so inspections can be made. Please remember that proper sanitation, exclusion and food storage are the key elements to successfully combating any rodent infestation problems. Trapping or baits will not eliminate the reason for the rats being present anywhere.

5. Snap Traps - Rat traps are very strong and can break a human’s finger. If you have children or pets, carefully monitor any areas with rat traps to prevent any injuries. Before handling any traps, do not touch any household pets. Rats will not approach a trap that has the scent of one of its predators.

Set live multiple catch traps or glue boards baited with a Cheerio or little piece of cookie wherever you see any droppings.

Rat POISONS - Rodenticide POISONS and bait stations

are a very common way to get rid of rats. Some rat POISONS kill rats within hours. Other rat poisons cause internal bleeding and kill rats in two to six days. Use extreme caution when using any rat poison, especially if you have children or pets. Ingesting the poison can be fatal, and small children and pets are prone to tasting things that are new to them. After the poison kills the rats, you will be left with the job of first finding and then disposing of the dead, stinking rats. This can be a dangerous task in itself because it exposes you to the diseases and parasites that rats are known to carry. The Author will not use any rat POISONS!

6. Other Rodents Controls: Make a “Walk-the-Plank®” trap by putting 30” of water in a garbage can or 55 gallon drum covered with a 3” of floating oats or sunflower seed or fruit (in the case of roof rats) and a plank or board up to the rim. Beer, e.g., Bud Light or Pepsi that still has its “fizz,” will kill rats and other rodents. (They can not get rid of the gas.).

7. Repellants: Peppermint will often repel rats and mice, so routinely clean with Safe Solutions, Inc. Enzyme Cleaner with Peppermint. Or you can soak some cotton balls in the peppermint and scatter them around or simply clean routinely with Safe Solutions Enzyme Cleaner with Peppermint. Powders and pellets can be spread around that are infused with the scent of a predator's urine, such

as a fox or badger. This will ignite the fear instinct in a rat, who will think the area has been claimed by a predator and will not return. Fresh Cab® is a simple and healthy way to repel rats - it is made with balsam fir needle essential oil, plant cellulose fiber from corn cob chips, and a combination of additional essential oils, including eucalyptus, Spanish rosemary, grapefruit, and lemon, All rat repellents must be used on a regular basis.

8. Outside - “Fumigate” active burrows with carbon dioxide or carbon monoxide. (You can use lit charcoal briquettes to create the carbon monoxide. You can use dry ice or a cylinder of CO2 to create the carbon dioxide.)

Rats are some of the most troublesome and damaging rodents. They eat and contaminate food, garden produce, and fruit, and transmit diseases to humans and pets. Manage rats by removing their food and shelter, and by eliminating all of their entryways into buildings, and trapping. Indications of a rat infestation. Rat droppings in garages, storage buildings, or attics, or around pet food containers. Rodent feeding damage on tree fruit or nuts in your yard. Rat nests behind boxes, in garage drawers, or in woodpiles. Burrows beneath garbage cans and compost piles or among garden plants. Rats traveling along utility lines or on fence tops at dusk. Is it a Norway rat or a roof rat? The stocky Norway rat builds burrows along building foundations, beneath rubbish, or in woodpiles. Indoors

they tend to remain in basements or on the ground floor. Roof rats are agile climbers with a tail longer than their head and body. They usually live and nest above ground in shrubs, trees, or dense vegetation. Indoors they favor attic spaces, walls, false ceilings, and cabinets. To get rid of rats, remove food, water, and shelter, and seal entryways! Feed pets only the amount of food they will eat at a single feeding. Keep garbage, trash, and garden debris in receptacles with tight-fitting lids. Thin dense vegetation and create at least a 2-foot space between each shrub as well as between shrubs and buildings. Thin or remove climbing hedges from buildings. Remove tree limbs that are within 3 feet of a roof. Seal all cracks and openings in the house's foundation that are larger than ¼ inch. Make sure doors, windows, and screens fit tightly. Remove rats from the home by trapping. Snap traps are the safest, most effective, and most economical way to trap rats. For Norway rats, place traps close to walls, behind objects, in dark corners, and in places where you have found rat droppings. For roof rats, place traps in off-the-ground locations such as ledges, shelves, branches, fences, pipes, or overhead beams. What about POISON baits? Avoid using baits indoors, because dead rats create bad odors. Seal buildings before baiting outside to prevent poisoned rats from coming inside to die. Place baits in tamper-proof bait stations and secure them from children and pets. All rodent baits are toxic to pets.

WHERE DO RATS LIVE OUTSIDE?

Under wood piles or lumber that is not being used often

Under bushes, vines and in tall grasses that are not trimmed or cut back

Under rocks in the garden

In cars, appliances and furniture that has been put outside and is no longer being used

In and around trash and garbage that has been left on the ground

In holes under buildings

WHERE DO RATS LIVE INSIDE THE HOME?

In the insulation of walls or ceilings

Inside the crawl spaces

Behind or under cupboards, counters, bathtubs and shower stalls

Near hot water heaters and furnaces

In basements, attics and wherever things are stored in boxes, paper or cloth

WHAT FOODS BRINGS RATS INTO MY YARD AND NEIGHBORHOOD?

Garbage that rats can get into, like garbage cans with loose lids, plastic or paper bags, and litter.

Food for pets and birds that has not been eaten. Birdseed on the ground, pet food in pet dishes, bread crumbs, etc.

Fruits and berries that have fallen to the ground.

Compost pile or worm bin that isn't taken care of the right way (do not put meat, fish, poultry, or dairy in the compost)

Dog droppings

WHAT DO RATS EAT WHEN THEY GET INSIDE THE HOUSE?

THE SAME FOODS YOU DO!

Foods, fats, oils that have been spilled and left on counters, floors, appliances and tables

Grains, like cereal, oats, rice and vegetables like potatoes and carrots that are in cardboard boxes and plastic bags

Pet food in boxes or bags

Any garbage that is not sealed in a can with a tight lid

KEEP RATS AWAY FROM YOUR HOME!

Do not give food and shelter to these most unwanted guests!

The time to act is before the signs (droppings) of a rat or mouse.

Stack fire wood 18 inches off the ground and away from all buildings.

Birdhouses and seed should be on poles and in trays rats can't get.

Keep garbage can lids closed tightly.

Plant bushes so they will stay at least 3 feet from your house.

Keep yards and alleys clean. Take junk to the dump!

If you feed them, they will stay. Pick up fruit and vegetables in your yard.

Do not compost any animal products (fish, meat, chicken, cheese, butter). Keep lids tight.

Use only rodent resistant composters.

In basements keep any food in closed containers that rats can't chew through.

Cover all openings to your house. Rats can get into very small places.

Do not leave your pet food outside. If your pet doesn't eat it, the rats will.

Roof rats get into your house from tree branches that hang over the roof. Keep trees cut back and cover any openings in the eves.

Keep rats out of your sewer pipes!

Rats live in sewers and can follow the food in pipes up to your toilet.

Keep your kitchen sink rinsed clean and use garbage disposals as little as possible.

Rinse out your kitchen sink once or twice a month.

Use 1 cup of bleach (an alternative to using bleach, 1 cup of baking soda followed by 1 cup of vinegar) and rinse with boiling water.

Never throw grease down the drain.

Keep your toilet lid down when not in use.

If you find a rat in your toilet, flush it! (hint: squirt a little dishwashing liquid under the lid into the bowl, wait a couple of minutes then flush)

TO KILL A RAT, USE A RAT TRAP!

The best trap is the large, simple, cheap wooden "snap trap." They are sold in hardware stores.

To use the trap:

BAIT IT with pieces of apple, potato, raw bacon or with peanut butter spread on a cotton ball. Make sure the bait is attached to trap.

ATTACH IT firmly to the ground or solid place to keep the rat from dragging the trap away.

PLACE THE TRAP near where you have found the droppings. Make sure the trap is safe from people, children, pets or animals who could get hurt from it.

Poisons are not recommended for rat control inside buildings, since poisoned rats can die in hard to reach places causing a very bad smell. When poisons are used, they must be secured (such as in a bait station) so that they are not available to children, pets or non-target animals. They must also be used in accordance with the directions on the label. For additional information, see also the WA Pesticide Control Act (Chapter 15.58 RCW), the WA Pesticide Act (Chapter 17.21 RCW) and the Rules Relating to General Pesticide Use (Chapter 16-228 WAC.)

DEAD RATS must first be wrapped in newspaper, or placed in a plastic bag before putting it in a tightly

covered garbage can. Injured or sick rats must be killed, then wrapped and put in the garbage can. Try not to touch the dead rat. Use gloves if possible.

WASH YOUR HANDS WITH HOT WATER AND SOAP AFTER GETTING RID OF DEAD RATS! (even if you used gloves).

How do I clean an area where rats/mice have already been?

If you are cleaning out a building that has been closed up, such as a cabin, shed, or garage, or areas where rodent nesting material have been found, follow these steps.

Air out the building for at least 30 minutes by opening windows and doors. Leave the building while it is airing out.

Wear latex or rubber gloves and a dust mask while cleaning.

Avoid raising dust that may spread the virus through the air: Do not vacuum, sweep or dust. Carefully wet down areas with disinfectant before cleaning.

Use rags, sponges and mops that have been soaked in the disinfectant solution to wipe down counter tops, cabinets and drawers, mop floors and baseboards.

Mix a solution of 1 cup bleach to 10 cups water or use a household disinfectant or better yet Safe Solutions Enzyme Cleaner with Peppermint.

Steam clean carpets, rugs, and upholstered furniture.

Thoroughly spray or soak any dead mice, droppings, or nesting areas with disinfectant or bleach solution.

Wash clothes and bedding in hot water and detergent. Set the dryer on high.

To dispose of contaminated items, including dead mice, put them in a plastic bag. Seal the bag and put it in

another plastic bag. Seal the outer bag and put it in your outdoor garbage can.

When you are done, disinfect or throw away the gloves you used. Wash your hands or shower with soap and hot water.

The Author prefers to simply and routinely clean and disinfect and repel at the same time using Safe Solutions Enzyme Cleaner with Peppermint.

SAFE LAWN AND OUTSIDE PEST MANAGEMENT

Weeds basically only grow where grass will not. The poison sprayers say they will "control" pest problems like dandelions, yet every year these "controlled pests" are back in the very same place. Because of all the synthetic pesticide poisons and fertilizers, our top layer of soil is now virtually dead. Plants do not chelate well without microorganisms. Soil must be alive, teaming with microorganisms or the lawn and/or plants will not be healthy. Pests like grubs multiply in these dead areas; add organic fertilizer and they quickly disappear. Proper irrigation will control crabgrass. In a few years even the weeds are choked out by healthy grass. Poisons do not protect; they kill. Before there were any "professional" lawn or pest control operators, we had natural fields full of grass that fed vast herds of buffalo who trampled it with their sharp hooves, yet it always grew strong and tall. This grass was never aerated or irrigated, never fertilized, never had insecticide POISONS yearly applied, never had fumigants applied, never had herbicides applied...the grass did extremely well without any man's help. Today we have spent hundreds of millions of dollars to develop grass so weak we must nurse it with fertilizer and poisons many times each growing season and we must constantly irrigate and then we must keep

off it or it will die.

The Author brags he has never done anything to his "lawn" but mow it and it stays green all season. You can drive on it and not kill it. You decide if you want a strong, natural lawn that feeds microorganisms and plants and other creatures and is healthy for your family and easy on your pocketbook or an expensive, sick lawn that needs your constant attention and money and may even be harming or even KILLING you. The EPA estimates that one out of every 10 public drinking water wells in the U. S. contains pesticide POISONS, as well as more than 440,000 rural private wells. At a minimum, over 1,300,000 people in the USA drink water contaminated with one or more of these dangerous poisons! Pesticide poisons have been found in thousands of lakes, rivers, and waterways throughout the nation. Agriculture is the number-one source of surface water pollution in the U. S.

In June, 1993, the National Academy of Sciences (NAS) released its long-awaited report on the health hazards posed to infants and young children from exposure to pesticide poisons in the food supply. The Academy stated that any pesticide poisons are harmful to the environment and are known or suspected to be toxic to humans. They can produce a wide range of adverse effects on human health that include acute neurologic toxicity, cancer, reproductive dysfunction, and possible dysfunction of the

immune and endocrine systems. Among the NAS's critical findings, existing pesticide poison policies do not protect the young adequately, instead the policies are treating kids as "little adults." Unique dietary patterns are ignored, although they result in far greater exposure to multiple pesticide poisons in food, by body weight, than occur in the adult population. The NAS expressed particular concern over children's dietary exposure to neurotoxic pesticide poisons stating that children tend to retain a greater portion of a given dose of certain toxins than adults and are not as capable of detoxifying them in their bodies. They are at greater risk from neurotoxins since the nervous system in an infant or young child has not yet developed fully.

Cause and Effect - We will never know if what we suspect about toxins having an adverse effect on our health is true - at least not from a purely "scientific point-of-view" - because, we will never be allowed to spray poisons on some statistical group of people (compared with an equal number of unsprayed people) to show actual or direct cause and effect. Because we can not spray people - the polluters of our world can continue to state pollution warnings are only based on junk science and only made by chemophobics and that there is no scientific proof that their "registered" poisons pollute, kill, harm or damage our world, people and/or pets. Rachel Carson studied the failed governmental attempts

to prevent the Japanese beetle from reaching Iroquois County, Illinois by repeatedly bombing with volatile, synthetic pesticide poisons from the air in the mid-1950's. Many insect species became sick (or died) from the poison, and were easy prey for insect eating birds and mammals. These creatures then became poisoned in turn and, in ever-widening circles of death, went on to sicken and kill those who fed on their flesh, leaving a landscape devoid of animal life, from pheasants to barnyard cats. The protracted poison war against the targeted pest, the Japanese beetle, on the other hand accomplished nothing; the "pest" continued its westward advance. The planes had been bombing with dieldrin which did remain to contaminate the soil and water for decades to come, like land mines left behind by a retreating army, guaranteeing further ecological tragedies, like the mute testimony of Iroquois County's dead ground squirrels: found with their mouths full of dirt, they had gnashed at the poisoned soil as they died in agony. Steve House, a friend of the Author, who was personally poisoned by these synthetic pesticide poisons, also saw tree squirrels die, the same way, in his native Detroit after they bombed with volatile poisons there.

Remember, whatever poison is used on your lawn or in your neighborhood will volatilize or be blown into the air by lawn mowers so you breathe it into your lungs. It will touch and enter your skin. It will sink into the soil so it

will eventually end up in the ground water or water that comes out your kitchen faucet. Your children will track the lawn POISONS into your home on their shoes and then walk, play and eat on the carpets and floor. Your children will also play ball on the contaminated lawn, get the poisons on their hands and then eat a sandwich, so it ends up inside the digestive tract. In addition, if they put pesticide poisons around the outside of your home around the edges, as a pest "barrier" and spray volatile poisons into the cracks and openings below and around your house, they can easily contaminate the inside of your home. If volatile poisons were ever used in the past by a previous owner, you might still be in danger. If volatile poisons were required by some state laws to be incorporated into the soil under the cement foundation of homes and under slab floors, these toxic vapors can continue to hurt your family for years. These volatile termite poisons definitely volatilize (leak out) into your air and can remain potentially dangerous for generations.

Pest Management at the Crossroads (way back in 1997), Consumers Union, Yonkers, NY noted that more than 500 insects, 170 weeds and 150 plant diseases are now resistant to one or more pesticide poisons - just another reason not to use them. True Integrated Pest Management is the fitting together of all pertinent data, constant monitoring and re-inspecting, methods, and common sense to safely control a pest problem. Methods including

Pestisafes™, natural enemies, e.g., pathogens, parasites and predators, cultural practices, mechanical alteration, microbial agents, genetic manipulation, exclusion, pheromones, traps, growth inhibitors, temperature controls and even (non- volatile) pesticides which all become mutually augmentative instead of individually operative.

The Journal of the National Cancer Institute, 71(1), July 1983 noted A study of 3,827 Florida pesticide applicators employed for 20 or more years found they had nearly 3 times the risk for developing lung cancer. The same study also showed the pesticide applicators had twice the risk for brain cancer. There was not any increased cancer risk when applicators were studied for only 5 years, implying it takes over 5 years to accumulate enough chronic damage to the genetic structure to develop the cancers.

Children who live in homes where registered, volatile, indoor or outdoor volatile pesticide poisons are used face a far greater chance of developing leukemia (leukemia is a cancer of the blood). The study, published in July's 1987 issue of the Journal of the national Cancer Institute, studied 123 Los Angeles children with leukemia and 123 children with the malignancy. The results showed the children living in the registered pesticide poison treated homes had nearly a 4-times-greater risk of developing the disease. If the children lived in homes were registered

pesticide poisons were used in the garden as well, the risk of developing leukemia was 6.5 times greater! All of the children in the study were 10 years of age or younger. Thus proving to some of us with working brains that cancer rates are not increasing merely because we are living longer!

The registered lawn pesticide poison active ingredients, mancozeb and chlorothalonil (used by commercial lawn spray companies as fungicides), have been classified by EPA as probable cancer-causing chemicals in humans as they have been found to cause cancer in animals (Newsweek, May 16, pg. 77, 1988)). Mancozeb has also been found to react with sunlight to form a new compound EPA categorizes as a known carcinogen (Newsweek, May 16, pg. 77, 1988). The common lawn pesticide 2,4-D has been shown to increase the risk of lymphatic cancer in farmers 6 times the normal rate according to a National Cancer Institute report (Science News, September 13, 1986).

A book from the Office of Technology Assessment entitled, Neurotoxicity: Identifying and Controlling Poisons of the Nervous System noted that an estimated 300,000 farm workers are poisoned by pesticide poisons in the U. S. Studies demonstrate that in addition to acute poisoning, pesticide poisons can cause long-term (chronic) damage to your nervous system.

Groups of test animals exposed to different pesticide poisons used in agriculture and lawn care showed over 50% more hyperactivity following a single exposure to the chemical. One of the main goals of this experiment, conducted by Dr. J. A. Mitchell and colleagues at the University of Michigan, was to investigate activity behavioral changes in test animals (male Swiss mice) following a single exposure to one of 4 different dosages of weed killers and fungicide poisons. The chemicals used included Lasso (containing alachlor), Basalin (containing fluchloralin), Premiere (containing dinoseb) and the fungicide poison Maneb-80 (80% Maneb). Test dosages ranged from a very low 4mg/kg to 4 mg/kg to 40 mg/kg. Even the largest dose was still below the LD50 for the animals (the amount needed to kill 50% of the test animals). According to the researchers, the herbicide poisons and fungicide poisons have received few reports investigating their toxicity while their yearly growth and production have grown far more than the insecticide poisons.

The detection of hyperactivity was measured by placing the test animals in steel cages that were equipped with electronic motion detectors which used infrared beams to count specific movements by the animals. After the single chemical exposure, activity was measured for a 4-hour period. Results showed the registered weed killer Lasso did not show any effects at the very low.4 mg/kg

level, but did show over a 65% increase in activity at the low 4 mg/kg and a 75% increase at the higher 40 mg/kg level. The registered weed killer dinoseb also showed no activity increases at the lowest.4 mg/kg dose, but did show a 15% increase at the 4 mg/kg level, and a 54% increase that the larger 40 mg/kg level. Other researchers have reported that activity provides a sensitive measure for evaluating the behavioral effects of the registered pyrethroid pesticide poison, deltamethrin, at doses that did not cause the characteristic neurotoxicological syndrome.

In conclusion the researchers stated, "The results of this study suggest that at least some registered herbicide poisons, in addition to pyrethrins, organophosphate and carbamate pesticide poisons, can produce behavioral manifestations following accidental exposure... The effects of the pesticide poisons on activity also support the hypothesis that these agents may affect the central nervous system" per Neutrotoxicology and Teratology, Vol. 11:45-50, 1989.

The article, "Chronic Neurological Sequelae to Organophosphate Poisoning. Am. J. Pub. Health Vol. 84, March 1994 noted:...that pesticide poisoning can lead to poor performance on tests involving intellectual functioning, motor skills and memory. The Author forgot how to count until he detoxed!

The pesticide MCPA, used as an ingredient in some lawn pesticides, has been found to damage a part of the brain known as the blood brain barrier per Toxicology and Applied Pharmacology, 65:23, 1982. The blood brain barrier is the brain's primary defense system which works to keep toxic substances out of the brain cells and is literally protecting all of us from developing immediate neurological illness. The blood brain barrier has been found to be defective more often in patients with Alzheimer's and some psychiatric disorders per British Journal of Psychiatry, 141.273, 1982. In fact, the lack of functioning of the blood brain barrier in the human infant has been reported on many occasions as being the reason why an infant is being found to develop brain damage after exposure to common chemicals, while an adult with a mature blood brain barrier does not. Unfortunately, EPA neurotoxicologist Dr. Bill Sette stated EPA still does not yet require chemical companies to test any of their pesticide poisons for causing blood brain barrier damage. Another study of 56 men exposed to registered organophosphate pesticide poisons detected memory problems and difficulty in maintaining alertness and focusing attention per Annual Reviews in Public Health, 7:461, 1986.

The Tulane-Xavier Center for Bioenvironmental Research in New Orleans said that combining two substances common to registered pesticide poisons

produces a synergistic impact on hormones 1,000 times stronger than the poisons alone. EPA only checks the active ingredient of a pesticide poison; it totally ignores the synergistic effect of two active ingredients, or even the active poison ingredient'(s) interaction with all of the inerts. This is like testing only the active ingredient in a cake (yeast) - thus, the "product" does not cause cholesterol problems, weight problems, diabetic problems, tooth decay, hyperactivity, etc. First of all, a pesticide poison does not contain just the REGISTERED ACTIVE INGREDIENT, which by definition is the poison actually used to kill or destroy a living organism. Pesticide poisons normally also contain unregistered inert ingredients as well as transformation products, synergists, contaminates and impurities, and quite often the pesticide poison breaks down into other materials, known as metabolites, which can even be more deadly than the original poison. Unregistered inert ingredients are also often more dangerous than the registered active ingredient, although the law allows the formulator to keep these untested and unevaluated chemicals secret from you and your doctor, because they supposedly are not added to the poison formulation specifically designed to kill (the pest). Inerts make up the majority of the concentrate/formulation and may include xylene, toluene, benzene, or even DDT! How can you honestly or legally register a poison label for use of the active ingredient

when the inerts' MSDS is far more restrictive in allowable usage?

On October 1, 1996, the California Department of Pesticide Regulation (DPR) suspended 21 pesticide products that contain the registered fungicide poison, chloreneb, the wood preservative creosote, and unregistered aromatic petroleum distillates, which are commonly used as inerts in insecticide poisons. On January 10, 1997 PANUPS announced that Monsanto agreed to change its advertising for glyphosate-based products, including the herbicide Roundup®. According to the State, the Monsanto ads implied the risks of products such as Roundup® are the same as those of the registered active ingredient, glyphosate, and do not take into consideration the possible risks associated with all of the unregistered product's inert ingredients.

The survival of the human species depends on the ability of males and females to reproduce successfully. Reproduction is a complex process involving multiple stages of vulnerability for parents prior to conception and birth of their offspring. Few established risks factors have been identified for failures that occur during many of these reproductive stages. In industrialized countries, about 1 of every 5 couples experiences difficulty reproducing. National Academy of Sciences Press, 1989. Exposures of pregnant females to a variety of foreign

substances may pose a threat to the health of offspring. In addition, exposures of males and females to foreign substances prior to conception can affect both their ability to conceive and the health of their offspring. Reproductive Toxicology 1992; 6:289-292. Timing of exposure to such substances may be more critical than the total dose rate in determining a broad array of outcomes. Environmental Health Perspective 1997; 105:70-77.

In 1994 the EPA noted the U. S. used approximately 1.2 billion pounds of just the pesticide POISONS' active ingredients; agriculture used about 939 million pounds (77%), industrial, commercial and government applications accounted for 150 million pounds (12%) and home and garden applications used about 133 million pounds (11%). These figures do not include chlorine, wood preservatives or specialty biocides. World pesticide use was estimated to be 5.7 billion pounds of only the active ingredients in 1995. In 2001, the National Coalition Against the Misuse of Pesticides noted we now use 4.5 billion pounds of pesticide poisons per year in just the USA! In 1996 EPA began a study to determine how much pesticide (poison) active ingredient residue (contamination) we can safely consume - (if we are lucky) we may get the results of how dangerous the food we are eating today is by the year 2006! When we set up interim numbers for acceptable levels of poison in people and pets, we are not only being very arrogant but very

ignorant. This is truly "junk science" at its finest. Urge any neighbors who use poisons or hire "professional" lawn care to read this book. We simply must stop polluting our precious planet. Our children are our most valuable and vulnerable asset, but everyone and every living thing is in jeopardy from the ongoing poison pollution including our pets, birds, fish and other wildlife.

THE BEST LAWN CARE

Pests in lawns and in homes must be approached in a manner similar to medical illnesses. The answer is not a more effective drug for a disease or another deadly poison for a bug. The challenge is to find the cause of a medical or pest problem and then to eliminate it. Then you have nothing left to routinely "treat". This is simply the best and most logical approach. Intelligent or Integrated Pest Management (IPM) is unquestionably the most cost effective and safest way to control pests inside and outside buildings As a healthy lifestyle prevents most illnesses, preventative pest control prevents most pest problems.

SAFE LAWN CARE OR IPM

There are many safe ways to care for your lawn. If you have healthy organic soil with lots of microorganisms you probably will not have any pest or disease problems. If you are going to hire someone, call and find out if all or part of a so called "natural" lawn company's care is truly safe (pesticide free) and if they guarantee to restore the life of the soil. Ask exactly what they use? Ask for MSDS sheets.

INTELLIGENT CONTROLS FOR WEEDS

Adjust mower to remove all dandelion heads and collect all clippings that are diseased or infected.

Spray weeds in cracks and along fences with straight urea, or 90% urea and dish soap, or 80% urea and 20% ammonia and a sticker, e.g., 1 oz. dish soap or straight vinegar and/or diluted salt or borax or with 3% essential oils or dust them with baking soda or spray with undiluted Coca-Cola. Always do this on a hot, sunny day, as this will help kill the weeds.

Cover weeds with black plastic for several days.

Start a good organic soil program. Do not use recycled human sewage. Use properly composted, organic chicken manure.

Put down a fabric (weed control) ground cloth or black plastic with drainage holes in it and mulch or stone over it.

Buy a cane flamer that uses propane to wilt weeds.

Spread Dow Flake® or simply salt or acid on areas where you want no plants to grow.

SCABIES AND MANGE

Scabies are caused by the microscopic mite (Sarcoptes scabei var. hominis). This mite, which is not a true insect but is more closely related to spiders, is widely distributed. It will infest and prefer certain parts of the body such as the skin between the fingers, the bend of the elbow and knee, the breasts, the penis, and the shoulder blades. It is not found above the neck. Apparently, newly infested persons experience no itching, so an infestation may progress extensively before being noticed. In about a month, a rash appears and intense itching is felt. This usually occurs at night and is caused by toxic secretions and excretions directly associated with burrowing by the mite. Scratching may cause secondary infection and helps the mites spread. The mites are transmitted by person-to-person contact, or by coming in contact with bedding, towels, or articles of clothing used by an infested individual. The fertilized female mite deposits oval eggs at intervals in the tunnel she makes in the upper skin layer (epidermis). Usually, she will remain in the tunnel for her lifetime, depositing eggs at 2- to 3-day intervals for a 2-month period. Larvae hatch in 3 to 5 days and move freely over the skin. They and nymphs often are found in hair follicles. Within 4 to 6 days after egg hatch, the nymph transforms into a male or an immature female. The female makes a temporary burrow in the skin before

mating. Maturity is reached 10 to 14 days after hatching. If you suspect an infestation of the mite, skin scrapings from the affected area should be taken by a physician or dermatologist and analyzed. Without this analysis, scabies cannot be accurately diagnosed.

Once an infestation is positively diagnosed as scabies, it is desirable to use Lice R Gone Shampoo and/or Tweetmint Enzyme Cleaners or take an Epsom Salt Bath. In addition, clothing and bedding should be washed in hot water (125 degrees F) with a cup of borax for 10 minutes. Clothes dryers exceed this temperature and will kill the scabies mite and eggs.

Mange (demodicosis) is an inflammatory disease in dogs caused by various types of the Demodex mite. When the number of mites inhabiting the hair follicles and skin of the dog become exorbitant, it can lead to skin lesions, genetic disorders, problems with the immune system and hair loss (alopecia). The severity of symptoms depends upon the type of mite inhabiting the dog. The condition or disease described in this medical article can affect both dogs and cats. Demodectic mange may either be localized and affect specific areas of the body, or generalized, where it affects the entire body. If localized, symptoms are usually mild, with lesions occurring in patches, especially on the face, trunk, or legs. If generalized, symptoms will be more widespread and appear across the

body. These symptoms include alopecia, a redness of the skin (erythema), and the appearance of scales and lesions. While an exact cause of mange in dogs is unknown, many experts believe genetic factors, such as problems with the immune system, may predispose a dog to developing mange. The Author has used both Safe Solutions Tweetmint Enzyme Cleaner and their Pet Wash to remove mange in dogs that did not respond to any other medical treatments. These two enzyme based products will also safely and far more effectively remove fleas, lice, tics and skunk odor! Once an infestation is positively diagnosed as mange on your pet shampoo them with Safe Solutions Pet Wash once a week for 4 weeks and them as needed.

SCALE INSECTS

These tan or brown shell, sap-eating insects like to live on the stems and/or the leaves of the plants in your home or your greenhouse. Scale insects can look hemispherical, oval or flat, and they can ruin a plant and stunt its growth by sucking out the sap. Scales can often be seen if you flip a leaf upside down and check out where the leaf portion of the plant joins the stem. You can also find them at the root of the plant or in the stem crevices, all of which make controlling them very difficult. The secretions can also lead to the growth of sooty mold, a fungus that is black in color. Scale insects suck plant juices and are pests of many trees and shrubs. Infestations can cause yellowing or premature dropping of leaves, sticky honeydew, and blackish sooty mold. Plant parts can become distorted or die back, depending on the species and abundance of scales. Management includes proper plant care, conserving natural enemies, and applying low-toxicity insecticide alternatives when needed. Most plants tolerate low to moderate numbers of scales. Damage resembles that of aphids and whiteflies.

Look for circular, elongate, or oval discolorations or raised areas on bark, leaves, or fruit. Immobile or slow-moving bodies or coverings 1⁄25 to 1⁄4 inch long that lack an obvious head or appendages and don’t resemble most other insects. Armored scales are tiny and flat, have

covers that usually can be removed from the body, and don’t secrete sticky honeydew. Common species include San José scale and California red scale. Soft scales are larger, excrete honeydew, and are more rounded and convex with covers that don’t lift off. Common species include black scale, lecanium scale, and brown soft scale. Learn the species or family name of your scale so you can identify effective controls. A popular systemic insecticide, imidacloprid, controls most soft scales but not armored scales, and it causes outbreaks of cottony cushion scale. To reduce problems, use an integrated program. Provide plants with proper cultural care, especially irrigation. Encourage scale natural enemies, all you have to do is put the predator insects directly on your plants. Once the scales have all be eaten off, the predator insects will all either simply leave or die from lack of food. Use sticky barriers or insecticide baits to selectively control scale-tending ants. Consider replacing problem-prone plants. Most scales are highly specific to certain plants. Avoid insecticides that kill and/or repel natural enemies. Here again, the Author believes that one of the simplest and most effective controls is a solution of (1 oz. per 2 quarts) Safe Solutions Tweetmint Enzyme Cleaner and water.

SCORPIONS

Although many people who live outside the arid southwest United States may never see a live scorpion, its shape is well known, and they can be found as far north as British Columbia. The scorpion's body form is characteristic, cephalothorax (fused head and thorax) elongate and dorsally shield-like, with an abdomen distinctly segmented with the last 5 segments tail-like ending in a stinger usually curved upward. The most common scorpion is the small, striped scorpion, Centruroides vittatus (Say) family Buthidae. This small arachnid is only about 1½ inch long, tan, with two broad dark stripes running lengthwise down the body. It is distributed across the southern states and can be commonly found under rocks on south hill slopes in Virginia, Kentucky and Missouri. Non-fatal, poisonous species occur in Florida and in the semi-arid Southwest. Two species are known to cause fatalities when they sting: Centruroides gertschi (Stahnke) and C. sculpturatus (Ewing) commonly called the Deadly Sculptured Scorpion or Bark Scorpion. These scorpions are from the family Buthidae are found in southern Arizona and neighboring states of California, New Mexico, and Texas. Actually C. gertschi is only a color variation of C. sculpturatus. There are about 40 species of scorpions in the U. S. - all of which can sting! Scorpions are most

common in rural areas and new subdivisions.

Scorpions are nocturnal. They hide under boards, rocks, rubbish and litter during the day. Scorpions are nocturnal feeders, so they forage at night, detecting slight air movements and/or minute vibrations, seeking insects, and sometimes, small mice. They can normally withstand starvation for 4 - 5 months. Scorpions blindly grab their prey with front, crab-like claws and quickly and repeatedly sting, whipping their stinger over their back. Scorpions can not see ultraviolet light, but ultraviolet light makes scorpions fluoresce - so, go out at night with a black light and carefully hunt this pest. Despite the scorpion's usual occurrence in dry climates, scorpions need access to water, or some moisture. Because they do need to drink water, their nocturnal feeding habits and tendencies to inhabit shady crevices and areas reduce the evaporation or loss of their body fluids. The crevices they hide in may be extended down to the moist areas of the soil. Scorpions also find daytime hiding places in crawl spaces, attics and closets. They enter occupied rooms, especially kitchens looking for water. Scorpions avoid temperatures over 100o F. and when the attic gets too hot they move downward into the laundry, bathrooms and/or kitchen where water is available. So, make some water traps.

Inspection

Thoroughly soak an area near the foundation with water and diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 - 2 oz. per gallon of water). Then cover with a piece of OSB board, plywood, paneling or heavy cardboard with a rock on top - check this "shelter" for several days for scorpions hiding under there and remove them or make a trap of diluted Tweetmint enzyme cleaner or soapy water in a shallow tray under the cover. Conduct a nighttime flashlight (or better still a black light they glow a fluorescent green color) inspection. Place your hands very carefully when searching in scorpion habitats. Wear high boots, heavy gloves and long sleeved shirts and then:

Carefully, look under outside harborage and in crawl spaces and attics with a black light at night.

Scorpions avoid temperatures over 100o F. and when the attic gets too hot - they simply move downstairs into the laundry, bathroom and/or kitchen areas where moisture is also available.

Inspect kitchen sink cabinets and bedroom closets.

Scorpions fluoresce under ultraviolet or black light; (they can not jump) so control is relatively easy.

Ground scorpions frequently burrow into sandboxes where they can remain without food and water for up to 6 months - you may have to screen the sand to protect the

kids.

Scorpions tend to lie still and blend into their surroundings.

Shake and examine all clothing and shoes before putting them on.

Move furniture and beds away from the walls.

Don't walk in bare feet. Always wear shoes when outdoors, especially around a pool at night or when ever in damp areas.

Be especially careful of wet/damp towels in the bathroom and pool area.

Habitat Alteration

Maintain an 18" vegetative free band around the perimeter of the building.

Tighten, weather-strip and/or caulk all points of entry. They usually enter by way of wall voids, so seal all visible openings. Store firewood, lumber, and garbage up off the ground.

Remove harborage, e.g., piles of wood, debris and/or trash around buildings and homes.

Repair plumbing leaks and ventilate moist areas.

Install screened vents or fans and/or a dehumidifier and/or a non-leaking air conditioner.

Insects are their principle food, so control the insects and you control the scorpions.

Exclusion and Controls

Repair door thresholds, doors, vents, and window screens, caulk and/or seal all openings.

Put crib legs in clean wide-mouthed jars, pull beds away from walls, shake all clothing before putting it on - remember, scorpions tend to cling to loose objects.

Dampen a burlap bag or piece of heavy, coarse cloth and spread it on the ground in the evening. Scorpions will crawl under it during the night and can be easily collected the next morning.

Use a black light and vacuum dry crawl spaces and attics, as a last resort have caring certified applicators dust under kitchen sinks and in closets where scorpions are seen with desiccating dusts, e.g., food-grade DE or try talcum powder or medicated body powder to baking soda or Comet®.

Foam/seal/caulk all cracks and crevices and/or voids.

Chickens will search out and destroy this pest outside. Now, the Mexican government even puts ads on TV advocating chicken control.

Cats usually of little value in mice control can be quite effective in controlling scorpions, but they must be trained how to do so safely!

Water baits with boric acid, borax, food-grade DE, diluted Safe Solutions, Inc. Enzyme Cleaner with

Peppermint or sodium borate or water/soap traps placed where scorpions can reach them but children, pets and wildlife cannot will work.

No commercial baits are available, but you can experiment with the above-mentioned materials.

In dry places, scorpions will congregate under moist burlap placed on the ground in areas of suspected activity. Carefully inspect and control the moisture seekers.

Routinely mop with diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or borax (1 - 2 oz. each per gallon of water.).

PUBLIC HEALTH IMPORTANCE

Caution: Every scorpion sting should be considered dangerous. Always consult a medical professional. Children, chemically-sensitive people, people with heart problems and/or elderly people are especially susceptible to the scorpion's poison. Call a doctor or emergency room immediately and cover with ice or immerse the bitten area in ice cold water. Scorpions will sting when touched, rolled over on when sleeping, stepped on, or otherwise provoked.

Remember that your initial inspection must be done very thoroughly. Some scorpions can live for 6 months without food or water and can hide for months after eating their fill. Carefully look all over - very thoroughly. Scorpions usually breed outside or under the building, possibly in the attic, but in most cases will be found in the crawl space, under logs, timbers, rocks, debris, or similar material. Thoroughly clean and caulk the entire building area so there will be no hiding places left for the scorpions. Thoroughly inspect at least an area for ten feet around the outside of the building and remove all debris, boards, rocks, firewood, etc. If you prepare boric acid or sodium borate water baits and they evaporate - simply add more water to the container - the boron products will still be there waiting to go back into the solution. Do not add any more boron to the bait container unless you first

wash it. If you use Safe Solutions, Inc. Enzyme Cleaner with Peppermint as a spray, use it at a rate of 1 - 2 oz. per quart. Note: Chickens love to search out and destroy scorpions. Inside the building, remember scorpions can and do hide anywhere, so carefully look everywhere in bathtub traps, in seldom worn shoes and boots, in areas under appliances, under sinks, in closets, and in similar dark or damp hiding places. All of these areas can be vacuumed and/or spot treated with lime, talcum powder or medicated body powder or Comet®, boric acid, silica gels and/or Safe Solutions food-grade diatomaceous earth for effective control. Routinely clean with (1 - 2 oz. per gallon of water) Safe Solutions, Inc. Enzyme Cleaner with Peppermint and/or borax.

Be sure to correct all leaks, routinely and thoroughly vacuum and clean the premises, use dehumidifiers apply silica gels, boric acid, Comet®, lime, talcum powder or medicated body powder lightly in all cracks and crevices, then caulk with silicone all openings. If you must use poison, follow the labeled product directions exactly and vacate the building for at least several days and thoroughly air out before re-entry. About 300 B.C.E., Theophrastus, in book 9 of his Enquiry to Plants, noted that wolfsbane, or scorpion plant (Aconitum anthora) kills scorpions if it is shredded over them. Pliny in book 20 of his Natural History, written in the first century A.D. advised that a mallow leaf (Malva) "placed on a scorpion

paralyzes it."

Final Note: Use a black light inside and out. Chickens love to eat them - so, let 3 to 4 chickens clean the exterior area for you for real innard-grated pest management. Diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or borax or, as a last resort, food-grade DE will kill scorpions when directly contacted. Remember, if you live in an infested area, put bed legs in wide mouth jars as scorpions can not climb on clean glass. Beds should not touch walls. Wrap bed legs with Gorilla brand duct tape (sticky-side up) and place duct tape (sticky-side up) around walls and where you see scorpions. Do not walk without shoes or at least sandals. Look underneath all objects you pick up and take out: clothes, bedding, footwear before getting into them. Turn on lights when getting out of bed and watch where you step and touch. Routinely clean, mop, and/or spray with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint and/or borax.

SKUNK ODOR

Safe Solutions, Inc. Enzyme Cleaner with Peppermint and/or their PET WASH will safely and effectively remove skunk odor.

SILVERFISH AND FIREBRATS

Entomologists call silverfish Lepisma saccarina and. firebrats Thermobia domestica. Silverfish like moist living conditions. Reduce the humidity in your home by investing in a dehumidifier and fans. It is important to fix any leaks and drips that way you are sure your dehumidifiers can do their job. Seal any gaps you have with simple silicone calk. Silverfish can live without food for 1 year. So once you get them it will be hard to get rid of them. Silverfish enjoy cereal grains, starches, paper, book glue, silks, cotton and many stored items - so, if you are planning to store clothes or books, make sure you don't put the clothes and books near each other and if you do, have separate tightly sealed bins for each with a bar of soap in each container to help repel silverfish. Keep your clothes off the floor- this is a nice hiding spot for silverfish. Cloves and cucumbers are natural silverfish repellants. Cut thick strips of cucumbers put them anywhere you are getting silverfish. Once the strips dry up, your visitors should be gone. If they are not, you can replace the dried cucumber strips with fresh ones and repeat this process until these pets are gone. Or, take several small mesh bags and put satchels of cloves in the corners of your home to prevent silverfish from invading. Or, take a bowl and mix water and flour and food-grade diatomaceous earth (DE) into a thick paste. Take some

index cards and coat with the flour/DE paste. Allow to dry completely and then place these flour coated index cards anywhere you see any silverfish. Wallpaper glue is a wonderful meal for these silverfish. So, remove all of your wallpaper and use a nice durable paint to deter these pests. Silverfish prefer damp, warm conditions such as those found around kitchen and bathroom plumbing. Start by vacuuming the area to remove food particles and insect eggs. Silverfish can be easily trapped in small glass containers. Wrap the outside with tape so they can climb up and fall in. They will be trapped inside because they cannot climb smooth surfaces. Drown them in soapy water. The best preventive control is to remedy the damp conditions and lightly dust with food-grade DE.

Silverfish and firebrats cause damage in homes by eating foods and other materials that are high in protein, sugar, or starch. They eat cereals, moist wheat flour, any paper on which there is glue or paste, sizing in paper (including wallpaper) and book bindings, starch in clothing, and rayon fabrics. Both of these insects are slender, wingless, and covered with scales. Adults are one-third to one-half inch long. Silverfish are shiny and silver or pearl gray in color; firebrats are mottled gray. The young insects look like the adults except that they are smaller. Both insects have two long, slender feelers at their head end, and three long, tail-like appendages at the hind end. Silverfish and firebrats are very common in homes throughout the

United States. Both are active at night, hide during the day, and avoid direct sunlight. When objects under which they are hiding are moved, they dart out and seek other hiding places. The silverfish lives and develops in dark, damp, cool places, especially basements.

Large numbers may be found in new buildings in which the masonry is still damp. Because silverfish require and seek a moisture source, they are frequently found trapped in sinks and bathtubs. However, they may be found in bookcases, around closet shelves, behind baseboards, and behind window and door frames. Silverfish are often brought into new homes in cardboard cartons, books, and papers from infested sites. In contrast, the firebrat lives and develops in hot, dark places: for example, in attics, around furnaces, ovens, and fireplaces, and in insulation around hot water and heat pipes. It prefers areas where the temperature is 90o F and above. Temperatures below 32o F and above 112o F readily kill immature stages of this pest. Change the physical environment in the immediate areas of infestation. Controlling or eliminating moisture where a silverfish population is thriving can be quite effective in significantly reducing the level of infestation. Reduce the potential sites of harborage. Seal obvious and easily accessible cracks and crevices. Do not leave silverfish and firebrats preferred places to hide and breed. Remove potential food supplies, specifically paper, book bindings, starched linens, and organic debris.

If these materials cannot be secured in tightly sealed containers or cabinets, make sure your pest control application cuts off access of these pests to potential food sources. Food-grade diatomaceous earth (DE) provides exceptional control of silverfish and firebrats, this dust can be used effectively in attics, dry crawl spaces, basements, and other places where its use is not potentially hazardous. Dusts are best applied with a hand duster, inject dust into cracks, or spread a thin film wherever the appearance of the deposit will not be objectionable.

SNAILS AND SLUGS

Adults are soft-bodied, land-dwelling mollusks. Snails have coiled shells on their backs and are 1 to 1-1/2 inches (2.5 to 4 cm) long. Slugs are without shells. Garden slugs are 1/8 to 1 inch (3 to 25 mm) long (longer when stretched out); banana slugs may be up to 4 to 6 inches (10 to 15 cm) long. Most slugs and snails are dark or light gray, tan, green, or black; some have darker spots or patterns. They leave a characteristic slimy trail of mucus behind them. Slugs and snails are hermaphrodite, each individual is both male and female, and is able to lay spherical translucent white eggs about 2-3mm across. Eggs are laid in batches of 10 - 50 and can often be found in the soil, in compost heaps and other dark, damp places. Up to about 500 eggs per slug may be laid in a season. They hatch into tiny versions of the adults in 3 weeks to 5 months depending on the time of year. Slugs and snails can live for up to four years but the lifespan is usually less. Eggs are clear, oval, or round, and are laid in jelly-like masses. Both snails and slugs will attack any tender plant or shrub. Both slugs and snails feed mostly on decaying plant material. They also eat soft, succulent plant tissue and rasp large holes in foliage, stems, fruit, and even bulbs. They can completely demolish seedlings and severely damage young shoots and plants.

Snails, and sometimes slugs, can climb into trees and

shrubs to feed. Both have higher numbers and cause most damage in wet years, and in regions with moist conditions, or high rainfall. Adults lay egg masses in moist soil, or under rocks or containers, or garden debris. Eggs hatch in 2 to 4 weeks. Slugs grow for 5 months up to 2 years before reaching maturity; snails take 2 years to reach maturity. Snails and slugs rank among our most despised garden pests. These slimy mollusks emerge from hiding at night and chew holes in leaves and flowers of many succulent garden plants and fruit. During cold or dry weather, snails can seal their shells, and remain dormant for several years. Typically, only 5% of the slug population is above ground at any given time. The other 95% is underground, digesting your seedlings, laying eggs, and often feeding on plant roots. The best way to prevent snails and slugs is to create barriers that they cannot cross. Any type of copper can be used to make a wall that electrically shocks their body, or wood ashes, or crushed egg shells, or Food-grade DE which will cut into their soft flesh.

Food-grade diatomaceous earth (DE) has been widely used for organic slug control, and can be effective. Some disadvantages are that you have to reapply it after rain and many times slugs can actually move directly through the product uninjured. And even so, the results are spotty. The heavy mucus they produce sometimes protects them from the (DE). A better option is a mixture of DE, hot

pepper, and cedar flakes. Other effective controls include garlic-pepper tea, which can be sprayed on plants that show damage. Proper management requires a vigilant and integrated approach that includes eliminating moisture and hiding spots, trapping, setting up barriers, and handpicking. Baits can be helpful but by themselves don't provide adequate control in gardens that contain plenty of shelter, food, and moisture. You might not observe these pests at first, because they feed at night and hide during the day. Go out at night or early morning to view them in action. Other pests can cause holes in leaves, flowers, and fruit. Look for the shiny, slimy trails slugs and snails leave behind. Remove daytime hiding places—ivy, weedy areas, debris, and boards. Regularly remove snails from shelters you can't eliminate such as low ledges on fences, undersides of decks, and meter boxes. Place traps in your garden and dispose of trapped snails and slugs daily. Reduce moist surfaces by switching to drip irrigation or sprinkling in the morning rather than later in the day. Consider snail-proof plants such as impatiens, geraniums, begonias, lantana, nasturtiums, and many plants with stiff leaves and highly scented foliage such as sage, rosemary, and lavender.

Lure and trap them. You can use boards, flat stones, or flower pots to trap slugs and snails. Put them around the garden, then lift the traps each day and get rid of any slugs or snails you find underneath. Another way to trap

them is to put pieces of potato, apple, or citrus rinds around the garden in the early evening. The rind from half an orange or grapefruit works great after you've eaten or juiced the fruit inside. Just put the rind on the ground, juicy side down. The slugs or snails will come to those baits and gather underneath. Then, a couple hours after dark you can hand pick them and kill them. Another type of trap uses beer. Dig out a shallow hole in the ground and set a pie plate or other shallow dish into it, so that the rim of the dish sits at the surface of the soil. Then, pour a little beer in the bottom. Slugs will crawl in to drink the beer and won't be able to crawl out! Be sure to check your traps often and get rid of any slugs and snails you catch, otherwise you're only giving them a home! Make sure the garden is mollusk-free before planting. Then erect a copper barrier around it. Use a 4- to 6-inch wide band of copper, buried an inch below the soil and bent over at the top or attached around the edge of a raised bed. Place your garden in the sunniest spot possible. Remove garden objects or adjacent plants or ground cover that can serve as shady shelter. Reduce moist surfaces as much as possible. Build a trap using a 12- by 15-inch board raised off the ground by 1-inch runners. As mollusks collect under the board, scrape them off and destroy daily. Baits won't be very effective unless you also remove shelter, food, and moisture. Metaldehyde baits are especially poisonous to dogs and

birds. Metaldehyde also loses its effectiveness rapidly in sunlight and after rain or irrigation. Iron phosphate baits are safe for use around dogs, children, and wildlife. Irrigate before applying bait and apply in the evening on warm days when mollusks are active. Scatter bait around sprinklers and in moist, protected areas where snails and slugs live or travel. Carefully plant or place mint, lemon balm, human hair (remove excess hair from hairbrushes and place in gardens), pine needles, cosmos, sage, or parsley in your garden. Put in a copper barrier.

Natural Controls

Maintain permanent stands of clover and mulches to favor ground beetles and rove beetles (which eat slugs). Centipedes also eat slug eggs. Other predators include small mammals, snakes, frogs, toads, lizards, birds, and carnivorous beetles. In the insect world their biggest enemy is the larva of the lightning bug. Since the Author imported a few lightning bugs - his mollusk problem has been greatly reduced!

SPIDERS

Spiders are seldom ignored. Their distinctive appearance, habits, and intricate webs command attention and evoke strong emotions. Given their due, spiders should be prized for their role as predators and natural regulators of insect populations, but because of their appearance and human cultural fears, when one is found to be potentially dangerous, sensationalizing it is irresistible. There are at least 35,000 species worldwide and at least 3,000 spider species and about 40 families in the U. S.; they are all categorized in the class Arachnida, order Araneae. Like their arachnid relatives the mites, spiders live in all parts of the world where they quietly make their way, snaring living prey in their webs or ambushing insect prey in episodes acted out in minute jungles and deserts. Arachnophobia or arachnophobia is a specific phobia, the fear of spiders and other arachnids such as scorpions.

Spiders are a diverse group and are the primary arthropod predators that naturally regulate many insect pests. The two-part spider shape is well known. Its head and thorax are combined to make the cephalothorax. Four legs are attached to each side of the cephalothorax. Spider eyes are in front - some have very large eyes. Like all arachnids, spiders have no antennae or wings and they all have 8 legs - insects only have 6. Spiders consume up to 2 times their own body weight every day! They live

everywhere - some species have been kept alive for over two years without feeding. Population densities of spiders are estimated to range from 27,170 to 5.4 million/ha for some habitats (Bristowe, 1958; Gertsch, 1979). While all spiders are poisonous to some extent, very few bite humans. Spider mouthparts, located in front below the eyes, have two short needle-tipped appendages, called chelicerae. These needles, or central fangs, are connected internally to poison sacs. The fangs are used to bite prey (mostly other arthropods) and inject poison to immobilize it. Two short leg-like mouthparts help hold their paralyzed prey, while the chelicerae work back and forth tearing the exoskeleton. As blood wells out, it is sucked into the mouth cavity and ingested. Spiders keep working their prey in this way until all the juices are gone and the remainder is a dry crumbled lump. The abdomen is located behind the cephalothorax; it is sac-like, usually globular.

Their anal opening is located near the end of their abdomen and close by are some short appendages called the spinnerets. Silk webbing threads out from these spinnerets. Spider silk has great elasticity and can stretch 1/5 of its length without breaking. The silk is protein and is digested by Tweetmint enzyme cleaners that contain protease enzymes. All spiders produce silk, and they use silk in more interesting ways than most other silk producers. Spiders make silk retreats such as tubes and

funnels, they make irregular cobwebs as well as the evenly spaced, spiraled great orb webs. Most spiders feed out a dragline wherever they walk and never fall off edges without catching themselves. While spiders don't have wings, they "fly"; nonetheless, by releasing a thread of silk until it is long enough for the wind to catch it and carry them off — the process is known as ballooning. Newly-hatched spiderlings use this method to leave the hatching area. Most species are nocturnal, unobtrusive - often pretending to be dead when molested - most spiders in homes are usually found in undisturbed, dark or dimly lit, cool, damp places - these areas are where people are most likely to be bitten when they "bug", accidentally imprison, or crush these beneficial hunters.

Basically only two spiders are considered dangerous to humans in the United States: the Black Widow and the Brown Recluse. In reality, these two names each represent several different species. Spiders are only distantly related to insects. Unlike insects, they have 4 pairs of legs but lack wings and antennae. Most spiders can be kept out of buildings by tight screens, weather-stripping and caulking. Keep screens and other openings in good repair. Caulk all seams around windows and doors. Indoors: Remove any intruders by vacuuming. All spiders are predators feeding primarily on insects and other arthropods but they can survive for very long periods without food. The average spider eats 100 bugs

per year. You are never more than 12' from a spider.

Ballooning spiderlings can ascend over 15,000' and have been sighted landing on ships sailing the mid-Pacific. Silk starts as a liquid protein which becomes a solid thread. An orb web may have 1,200 junctions, each crafted perfectly. The spider must calculate the exact length and tension of each succeeding line so the earlier ones don't go slack. Slack lines don't transmit vibrations. The standard orb web is completed in only 20 minutes at about 3 - 4 a.m. Most orb weavers rebuild their webs once a day; they take the web down and eat it to be completely recycled in their body and reused in about 30 minutes. Spiders coat their feet with an oily fluid from their mouths so they don't stick to the webs. Spiders can replace lost legs.

First Aid: For any bite or sting it is important to reduce stress and help the inflicted person to relax. There is evidence that this will reduce the toxic effects of some bites and stings (Ebeling 1975). An ice cube may be applied for a short time to reduce pain at the site of the bite or sting; this does not reduce the effect of the bite, but may make the afflicted person more comfortable. (DO NOT IMMERSE THE WHOLE LIMB IN WATER.) If in doubt about the seriousness of a bite or sting, or if a person is bitten or stung by any of the medically important species discussed in this little book -

contact your local poison control center or a physician immediately. Also, collect the spider in question if possible to assist in the treatment of the bite or sting. Always see a health care provider if bitten by any spider.

The bite of most spider species is not considered to be dangerous. But, any bite or sting may elicit an unusual allergic reaction by persons who are hypersensitive to the bite or sting of a specific species. For this reason all bites must be examined to ensure the safety of those involved. A hyperallergic reaction can lead to anaphylactic shock and in very severe cases, respiratory distress may develop. It is not unusual for a person to have some pain and numbness in the same region as the site of the bite. However, if, for instance, a person is bitten on their hand and their legs begin to swell, this is indicative of a systemic reaction, and this person should receive medical attention as soon as possible.

People who are known to be hypersensitive to other stinging insects such as bees and wasps are not necessarily hypersensitive to spider bites. Likewise, each spider has a very specific type of venom and a person may be sensitive to the venom of one species and not sensitive to the venom of a closely-related species. Lastly, some anti-venoms are available for treatment of some bites and stings, but their availability is variable. Contact your local poison control center for information

regarding anti-venoms if dangerous spiders are a problem in your region.

Inspection - A thorough inspection of the building is essential and should be made at night because most spiders are nocturnal.

Proper Identification - Accurate identification is important for both pest management and medical reasons. Place glue boards/monitoring traps or duct tape (placed sticky-side up) in the area where the spider was seen.

Prevention/exclusion - This consists of making sure that the building is in good physical condition, and properly screened and sealed to reduce entry. Also, changing the exterior lighting to off-building locations, from mercury vapor to sodium vapor lamps or amber lights, or in the case of homes, changing the bulbs near the entrances to yellow bulb, may be of some help in reducing insect/spider attractive- ness. Install vapor barriers, vents, fans, air conditioners, and/or dehumidifiers to change the conditions conducive to infestation.

Sanitation - Such practices consist of keeping the premises free of debris such as boxes, papers, clothing, scrap and lumber piles, etc.; it is wise to wear protective gloves and clothing when cleaning out such accumulations of clutter. A thorough housecleaning should be done a minimum of twice each year. Try lightly sprinkling talcum or medicated body powders or

Comet® or DE around sill boxes and openings. Routinely vacuum and clean with Safe Solutions, Inc. Enzyme Cleaner with Peppermint (1 oz. per gallon of water).

Mechanical measures - The key to control is the timely mechanical removal of all visible spiders, webs, but especially the egg sacs with a vacuum, both inside and outside; seal or wrap the bag in plastic and properly dispose of the bag immediately after you finish vacuuming.

A simple Spray - 1 oz. of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint per quart of water will kill most spiders in a few seconds.

Dehumidifiers and Ventilation - The reduction of moisture reduces many insect infestations which limits spider food sources. Spiders like most arthropods are also very sensitive to moisture loss and will quickly leave overly dry conditions. So properly ventilate and install and maintain fans and/or air conditioners and/or dehumidifiers in basements, crawl spaces and attics.

Follow-up

When webbing is found, either vacuum or sweep it down, which will also eliminate spiders and egg sacs. This will help you determine your degree of control on future visits. Note: 1 acre may contain 2 million spiders. There are about 50 spiders for every square foot of grass. Remove or exclude the insect pests they feed on. Routinely steam clean or thoroughly wash/clean with Safe Solutions, Inc. Enzyme Cleaner with Peppermint and/or borax. Remember spiders are beneficial creatures.

Vacuum up all visible spiders, webs and/or egg sacs (300 hundred spiders may be in a single egg sac).

Routinely clean (with 1 oz. per gallon) or spray (with 1 oz. per quart) of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and/or borax. Borax will kill plants.

Spray straight 5% white distilled vinegar with a teaspoon of coconut oil to help remove and help prevent spider webs.

Routinely steam clean or vacuum the entire area. Do not store clothes, packages, materials for extended periods of time without cleaning them all or sealing them in plastic.

Lightly sprinkle talcum or medicated body powder or Comet® or food-grade DE in sill boxes and along walls, etc.

Spiders are mostly beneficial because they feed on pest insects. However, many people think that all spiders are dangerous and aggressive. Usually, the only spiders capable of causing serious injury are the brown recluse and the black widow. Spiders seen out in the open during the day are unlikely to bite people. Focus pest management efforts on removing webs and hiding places. Pesticide POISONS are not generally recommended.

What to know about spiders:

The main spider capable of causing serious injury is the black widow:

The poisonous black widow spider is commonly found outdoors, in sheltered, dry, undisturbed areas such as wood piles. Female black widows have shiny black bodies with a red hourglass marking on the underside. Only large female black widows can injure people. Anyone bitten by a black widow spider should remain calm and seek medical advice.

The Brown recluse, violin, or fiddleback (Loxosceles), spiders are about a half inch long with a dark violin-shaped mark on the combined head and midsection (cephalothorax). They are found most often in the south-central part of the United States and live in hot, dry, abandoned areas, such as wood or rock piles. Brown recluse spider bites don't always hurt right away. In fact, you may not know that you have been bitten until other

symptoms appear. Symptoms of a brown recluse spider bite include: Reddened skin followed by a blister that forms at the bite site. Mild to intense pain and itching for 2 to 8 hours following the bite. An open sore (ulcers) with a breakdown of tissue (necrosis) that develops a week or more following the bite. This may take months to heal. Some people have a severe, systemic (whole-body) reaction to brown recluse spider bites, including the rapid destruction of red blood cells and anemia (hemolytic anemia). Symptoms include: Fever and chills, Skin rash all over the body with many tiny, flat purple and red spots, Nausea or vomiting and Joint pain.

The jaws of most spiders are too small to bite humans. Some other spiders can bite when trapped in clothing, but the reaction is no more severe than itching or a bee sting.

To prevent spiders from entering your house, take these steps:

Seal home foundation cracks and other access holes

Inspect window and door screens for good seals that keep out spiders and the insects they prey on.

Keep areas around home foundations free of clutter.

Manage spiders using these tips:

Indoors, regular housecleaning provides adequate spider control.

Vacuum up the spiders their eggs and webs.

Prevent clutter buildup that can provide hiding places.

Remove spider webs from the exterior of the house with a broom or high pressure hose.

Indoors, squash spiders or capture them in a jar and release them outdoors.

Here again, the Author believes that one of the simplest and most effective controls is a solution of (1 oz. per quart) Safe Solutions Enzyme Cleaner and water.

Spiders taste through their feet and don’t like the taste of citrus or peppermint. So using citrus oils as well as peppermint can detract them from coming into an area. I’ve heard that lemon & peppermint essential oils are the best oils to use because they have a very strong smell and peppermint can actually feel hot as well.

When removing spiders, don't overlook the fact that spiders eat a large number and variety of nuisance and pest insects. Spiders also have natural enemies—wasps, other spiders, birds, reptiles and others—that sometimes keep them from becoming too numerous.

SPIDER MITES.

Although related to insects, mites aren’t insects but arachnids, similar to spiders and ticks. Mites are tiny and difficult to see. Look for webbing and check the undersides of leaves to see if spider mites are present. Sprays of water, diluted Safe Solutions Enzyme Cleaners with Peppermint, insecticidal oils, or soaps can be used for management. Spider mites have many natural enemies that often limit their populations.

What to look for:

To the naked eye, spider mites look like tiny, moving dots. You will need to use a magnifying lens to see them.

Adults are less than 1/20 inch long and have eight legs, an oval body, and two colored eyespots near the end of the head.

Spider mites live in colonies, mostly on the under surfaces of leaves; a single colony can contain hundreds of mites.

When numbers are high, their dense webbing can cover leaves, twigs, and fruit.

Mites cause damage by sucking cell contents from leaves.

A small number of mites usually isn’t cause for concern, but very high populations can be damaging, especially to annual plants.

Often, damage first appears as a stippling of light dots on the leaves; sometimes leaves turn a bronze color. Heavily infested leaves can turn yellow and drop off.

Damage usually is most severe in hot, dusty conditions and on water-stressed plants.

Protect spider mite natural enemies.

Spider mites have many natural enemies, which prevent them from becoming pests in many landscapes, especially when undisturbed by pesticide POISON sprays.

Key predators include predatory mites, which are about the same size as plant-feeding mites but have longer legs and are more active.

Other common predators include thrips, lacewings, and lady beetles.

Keep dust down. Plant ground covers, use mulches, and irrigate regularly.

Avoid using insecticide POISONS that kill natural enemies.

How do I control spider mites?

Water plants sufficiently to avoid drought stress, which increases mites and damage.

Most woody plants can tolerate low to moderate mite populations, and natural enemies often are abundant.

At least once a day, spray or thoroughly mist with water the underside of foliage in gardens and on shrubs and

small trees.

If you wish to use an insecticide, a good choice is Safe Solutions Tweetmint Enzyme Cleaner or a combination of an insecticidal oil and soap applied so you completely cover the undersides of leaves. Be sure mites are present before treating. Do not spray when plants are water stressed or if it is very hot.

Spider mites frequently become a major problem after applying persistent insecticides such as carbaryl or pyrethroids; not only are these insecticide POISONS not very effective against mites, they often kill off their natural enemies and stimulate mite reproduction. Here again, the Author believes that one of the simplest and most effective controls is a solution of (1 oz. per 2 quarts) Safe Solutions Tweetmint Enzyme Cleaner and water.

STINGING INSECTS

The insects considered most beneficial to humans are found in the large insect order Hymenoptera. Not only are the bees and many of their relatives pollinators of flowering plants, including fruits and vegetables, but thousands of species of small wasps are parasites of other arthropods including pest insects. Without these parasites that limit the growth of insect populations, pests would overtake most of our crops. Volatile, synthetic pesticide POISONS are not species specific. They kill everything, including all the beneficial insects - and maybe you, your family and pets. The urban pests of the order Hymenoptera are the stinging insects. Although the first image to come to mind implies danger to humans, these yellow jackets, hornets, and wasps sometimes serve our interest: they feed their young largely on flies, spiders and/or caterpillars. But, in 1990, 32,662 small animals in the U. S. required a trip to the vet after being stung by bees or wasps. In 1988, the Federal Center for Disease Control in Atlanta reported 34 human fatalities due to known wasp or bee stings. About 100,000 U. S. citizens are stung yearly by wasps or bees. The majority of stinging victims suffer normal reactions to the venom, such as pain and swelling. A smaller number of people will be hypersensitive to the venom and can suffer a fatal anaphylactic shock reaction.

Many of these stinging insects are social. They live in colonies with a caste system or a division of labor and overlapping generations - all offspring of one individual reproductive. Some of these colonies persist: for many years (ants, honey bees) and others, like stinging wasps, start anew each year. In parts of the United States, particularly in the eastern states, yellow jackets, wasps, hornets and bees are all called "bees" by the general public. Of course the general public is principally focused on one attribute these insects have in common - their stingers. If stung, try a little fresh squeezed onion juice or a meat tenderizer paste or diluted enzyme cleaner and/or see a doctor. Knowledge of the behavior of these stinging pests is essential to their management; effective communication with frightened or, at best, fearful occupants is an important skill you must develop. Nests of stinging pests are usually the target for control. Understanding nesting and the make-up of the colony is essential.

How to avoid being stung: Bee-ware!

Do not cook or eat or drink outdoors during yellow jacket season.

Do not wear light blue, yellow, and/or brightly colored and patterned clothes or bright flashy) jewelry.

Do not wear scented talcs, perfumes, colognes and other scents, including scented hair spray, suntan lotion,

sunscreen, cosmetics, deodorants and shaving lotions.

Do not sit down on or handle wet towels, washcloths or clothes without first checking to make sure no yellow jackets are drinking the moisture.

Do not carry sugary or meat snacks in open containers.

Do not drink soft drinks from open containers. Use a glass or a lid and/or a straw.

Do not hit or swat at bees or yellow jackets. Squashing a yellow jacket can release a chemical pheromone (alarm) that signals other wasps and yellow jackets in the area to come attack you. Yellowjackets will not usually sting or bite a person at rest, if they or their nest have not been disturbed or threatened by a person's swatting or by the quick movement of their arms or legs. They may land on your skin to inspect a smell or even to get water if you are sweating heavily, but they will leave of their own accord if you stay calm and do not move quickly. If you lack the patience, you can brush them off gently with a piece of paper as long as you move slowly and deliberately.

Do not walk directly into the flight paths of these stinging insects.

Do not go barefoot, especially through vegetation.

Do not shine a flashlight or cast a shadow on the nest at night. Use a red light.

If a bee or wasp enters your moving car, pull off to the side of the road and stop, if possible; open the windows and safely let it fly out and leave by itself.

Wear proper safety protection, not only during treatment/control but also during inspections.

Wear gloves when picking up rocks, timbers and firewood. Use a rake to move debris and mulch.

Don't vibrate, hit, move, touch or make any unnecessary movements around the nest.

Activities, e.g., running, screaming, and flailing only agitates wasps and bees.

Final Note: If you have any sensitivity to insect stings, you should never attempt any control activity. Bee-Careful!

General Control Notes - Since bees, yellow jackets, hornets and wasps are all considered to be beneficial insects, control should only be done where there is an imminent threat to people or their pets. These insects can (when provoked) inflict a painful, venomous sting and/or bite. Some people are so sensitive to the venom's complex amino acids, proteins and enzymes they develop severe allergic reactions known as anaphylaxis and may even die without an injection of an antidote. Africanized bees (or killer bees) can and do kill normal people during an attack frenzy that can include hundreds of stings. If the killer bees attack, run away in a zig-zag pattern. Kill the

killer bees quickly and safely with diluted dish soap! Remove or cover all garbage, dropped fruit, soft drinks, pet food and other protein and sugar food sources. Routinely clean all dumpsters, garbage cans and spills, then routinely clean or spray with diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint and/or borax. If you spray stinging insects with 1 oz. per quart of Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint, they generally die within a few seconds, or simply vacuum them up. Safe Solutions, Inc. Enzyme Cleaner with Peppermint (1 oz. per quart of water) will kill them all on contact and also has a "fumigant" action.

Wear protective clothing. Spills and dumpsters should be cleaned up regularly with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint and borax. Never caulk an active nest/hole. Plastic barrier tape can be used to cordon off active infestations to protect children from "investigating" the infested area.

Spray any visible stinging insects and nests with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint (1 oz. per quart). Spray paper wasps with soapy water to make them "drown." Use a hose-end sprayer filled with dish soap to flood and remove wasps, hornets, mud daubers and their nests. You can also spray them with rubbing alcohol. Bee careful!!

Secure the sucking end of a vacuum by their nest opening

at night. If you use a rinse-and-vac fill it with 3" of soapy water; if you use a dry vac, add 1 teaspoon of talcum powder or 2 tablespoons of cornstarch. If their nest opening is over 1", make it smaller. Turn the vacuum on before dawn and let it run until dark. Repeat as needed. Only after the nest is emptied should you caulk the opening. Duct tape, copper mesh, spackle, caulk, hydraulic cement and screens are exclusion materials that should be used abundantly. Vacuums can also be used to quickly and safely remove stinging insects from inside the building. Bee careful!

Make 2-liter wasp traps by cutting off the top (where the bottle begins to curve up), invert it into the bottle (like a funnel), duct tape the edges, add 2" - 3" of Blue Hawaiian Punch or sweet orange pop (add some raw fish or hamburger if needed) and set out by the dumpsters or hang some from trees and facias wherever you see stinging insect activity. You can also make a good bait with a mixture of fruit juice and beer. Once inside the beer gives off its CO2 which is heavier than air and pushes the air out. The CO2 in the trap quickly suffocates the stinging insects. You can also use carbonated fruit juice to get the same result. Sticky window fly scoops or fly paper or glue boards in window casings will often catch individual stinging insects as they fly to the light of the window. Turn off all but one light or darken all windows but one and vacuum them up. Bee careful!

Dust ground nests at night with talcum powder or Comet® or medicated body powder or Safe Solutions food- grade DE and/or soak them thoroughly with diluted Safe Solutions, Inc. Enzyme Cleaner with Pepper- mint (1 - 2 oz. per gallon of water) with a hose-end sprayer at night. Cover them at night with a clear glass bowl or piece of plate glass and leave covered for 2 weeks until they die. You can also "fumigate" ground nests (at night) with 5 lit charcoal briquettes that create carbon monoxide. The carbon monoxide is heavier than air and will kill the underground nest. Bee careful not to get stung or to start a fire! An alternative, safer fumigant is dry ice; the CO2 is also heavier than air. Bee careful!

Rinse empty dumpsters with a hose then spray diluted Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint to the point of run off and double bag and securely tie all trash. Install strong fans to literally blow yellow jackets away. Spray the clean dumpster with diluted borax (1-1/2 cup per gallon of hot water). A garbage can with a domed, fitted top with vertical swinging doors will keep yellow jackets away from the flies in the garbage.

At night (with a red light) inject aerosol foam insulation into the entire nest if it is in a tree cavity or in a log or in an exterior wall void.

You can "fumigate" ground nests with carbon dioxide or

carbon monoxide. Never seal any nest site entrances until you are sure all activity has ceased.

Make sweet liquid baits with 5% food-grade DE or aspartame in honey or molasses and place the baits out of reach of children and pets in yellow caps or dishes.

STINK BUGS

Do your best to prevent stink bugs from entering your home. Placement of screens over windows, doors and vents, removal of window air conditioners and caulking cracks in windows and doorframes will deter the adults from entering. Removal of window air conditioners is important, as numerous stink bugs will enter this way. If small numbers occur indoors, they can be removed either by hand or by using a shop-vacuum. Stink bugs found indoors can usually be controlled with a vacuum cleaner. Attics can harbor stink bugs which migrate in living areas of the home. Sprinkle Food-grade Diatomaceous Earth (DE) both outside and inside, focusing on entryways like windows and doors along with other areas where stink bugs seem to gather. Make a garlic spray. Mix 2 cups water with 4 tsp. garlic powder in a spray bottle. Spray this solution onto plant leaves, windowsills, and other areas stink bugs frequent. Stink bugs do not like the potent odor of garlic and generally stay away when garlic is nearby. It only repels the insects instead of killing them.

You can also chop several cloves of garlic and spread the pieces around stink bug hide-outs. Keep stink bugs away with mint. Mix 2 cups of water with 10 drops of mint oil in a spray bottle. Spray the solution around possible entryways and hide-outs. Like garlic, mint only acts as a

repellent rather than a poison. The strong odor is often successful in keeping stink bugs away, though. Instead of mint oil, you could use 2 tsp. ground mint leaves. Use catnip. Sprinkle catnip powder around your garden and home, focusing on areas that are prone to stink bug infestation. Catnip is another repellent that scares stink bugs away rather than killing them. Catnip is an herbal plant, and you can grow it in your garden instead of buying it if you have the time and are interested in having a long-term defense against stink bugs. Spray the stink bugs with soapy water. Mix 32 oz. hot water with 3/4 cup mild dish soap. Spray this solution directly onto stink bugs or in areas where stink bugs gather. Soap kills stink bugs by breaking down their protective exterior and dehydrating them. Antibacterial soap can be used, but it contains more chemicals than non-antibacterial soap. Mild dish detergent is generally considered the safest, most natural option.

Use neem oil. Combine 32 oz. warm water with 1 to 2 tsp. neem oil in a spray bottle. Coat leaves, windowsills, and other potential entryways or hiding spots with this solution. You may need apply a week's worth of neem oil before you notice any changes. Neem oil works by disrupting the eating and mating instinct of insects. As a result, adult stink bugs that are exposed to it will gradually starve themselves and will not lay any eggs. Physical Removal - Vacuum them up. Suck the stink

bugs up using an industrial vacuum or a vacuum cleaner with a bag. Remove and discard the bag immediately. After vacuuming up the stink bugs, your vacuum is likely to smell foul for several weeks or months. For this reason, you should not use a bag-less vacuum that you use at home. Empty the bag's contents into a large garbage bag and seal the bag tightly. Alternatively, you can wrap a knee-high stocking around the vacuum tube. Secure the stocking with a rubber band and push it inside the tube. As long as the stocking remains secure, the stink bugs should be caught inside it instead of entering the vacuum filter. You can remove the stocking, holding the end closed, and dispose of the stink bugs from there.

Knock them into a container of soapy water. Fill a 1-gallon bucket 1/4 full with water. Mix in 1 tsp. dish detergent or liquid soap. Position the bucket beneath climbing stink bugs and flick them down into the solution using a gloved hand. The soap will make it difficult for the insects to move, and they will ultimately drown in the water. As far as stink bug elimination methods go, this is probably the closest to a "stink free" option since the bugs are killed relatively quickly. Spread fly tape along entryways. Place sticky fly tape along windowsills, doorways, cracks, vents, and any other notable entryways into your home. Check the tape every day, discarding it as it fills up and replacing it as necessary. Since this is not a quick death, trapped stink bugs may give off their

trademark odor after being caught. If you do not have fly tape, you can also use double-sided tape or Gorilla brand duct tape.

Exclusion - Seal your doors and windows. Seal any cracks or gaps in your window and door trims with caulk. The most common entryways for stink bugs include windows, doors, baseboards, and ceiling lights. Filling gaps or correcting loose seals should significantly decrease the number of stink bugs roaming through your home. Place protective screens over air vents. Use mesh fence screening to cover dryer vents, air vents, chimneys, and other open areas connecting the outside of your home with the inside. Patch up any holes that are larger than 1 inch in diameter. Instant adhesive and epoxy should be enough to patch small holes in screens. Collect the bugs on a damp towel outside. Hang a wet towel over a lawn chair outside at dusk. In the morning, a large number of stink bugs from your yard should be gathered on the towel. You can drape the towel over a deck railing, empty planter, tree branch, or any other surface in your yard. It is better for the towel to drape vertically than to be spread out horizontally, though. Exterminate the stink bugs on the towel by quickly dunking the entire towel, bugs and all, into a large bucket of soapy water.

Control your weeds. Remove or thin heavily weeded areas in your garden. Stink bugs tend to be attracted to

weeds. Reducing the amount of weeds present in your yard or flowerbeds will make the area seem less appealing to stink bugs, so fewer will come. Fewer stink bugs in your garden also means fewer in your home. Attract stink bug predators. Natural predators include parasitic flies, wasps, birds, toads, spiders, and praying mantises. Grow wildflowers and herbs. These attract parasitic flies and wasps. Attract birds, toads, spiders, and praying mantises with perennial herb and flowers. You can also buy praying mantises in garden supply catalogs. Minute pirate bugs, which eat stink bug eggs, can also be bought from garden supply catalogs.

Their name certainly doesn't lend itself to culinary appeal, but stink bugs (Hemiptera order) are consumed throughout Asia, South America and Africa. The insects are a rich source of important nutrients, including protein, iron, potassium and phosphorus. Because stink bugs release a noxious scent, they are not usually eaten raw unless the head is first removed, which discards their scent-producing secretions. Otherwise, they are roasted, or soaked in water and sun-dried. As an added benefit, the soaking water which absorbs the noxious secretions can then be used as an alternative pesticide to keep termites away from your home.

STORED PRODUCT PESTS

About 300 different types of moths, weevils and beetles can be found eating "your" stored food products (grains, peas, beans, spices, nuts, cheese and macaroni mixes, pancake mix, raisins, cereals, pasta, etc.) in "your" pantries, home decorations, animal bedding, dog food, birdseed, dried fruits, candy, etc. Many of these pests are now resistant to all commonly used pesticide POISONS, but there are some safe and effective ways to prevent and control them.

First, recognize where you have the problem. Look for flying moths or caterpillars in cupboards on walls and ceilings or beetles crawling around near or in food. Look for evidence on and in packages such as pests or tiny holes in strange places, cast-off skins, tracks, fine dust, excrement, etc. Look for and vacuum them up off walls and from behind moldings, pictures, clocks, wallpaper paste, flower pots, hinges, and in cracks and crevices.

The first step and main control is to throw away all pest infested foods and spices. Then install and properly maintain air conditioners, fans and a dehumidifier which will reduce humidity to a point that it is disagreeable to insects. Use 20 mesh screens that fit windows and doors properly.

Routinely and thoroughly clean/vacuum the cupboards

and pantry. Clean the entire area with (1 oz. per gallon) Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint.

Purchase insect-free products. Look at the food package very carefully when the box or bag is opened initially and later on. If you buy a new infested product from a store, return them and/or go to another store. Store all susceptible foods in sealed insect-proof containers or in the refrigerator and/or below 50o F.

All broken containers, torn sacks and spilled foodstuffs and/or infested material should be removed and tossed out promptly. Dispose of all out-of-date and/or infested food stuffs. Lightly sprinkle baking soda or talcum powder. Practice first in/first out inventory control. Supplies should be properly stored and used as quickly as possible.

Dry animal feed and pet food should be stored away (isolated) from cereal products and dried fruits. Keep it in the freezer if possible, or at least stored in a tightly sealed pail.

Store all food stuffs in insect-proof glass containers and/or below 50o F.

A good trap for moths is one part molasses with 2 parts of vinegar; place in a yellow bowl. Clean as needed. Lightly sprinkle baking soda or talcum powder or food-grade DE.

Install and properly maintain air conditioners, fans and a

dehumidifier.

Use 20 mesh screens that fit windows and doors properly.

Purchase and use stored product pheromone traps at your grocery or hardware store. The odor attracts insects of the opposite sex, similar to how human pheromones affect us.

Steam clean with a steamer.

Food-grade DE is wonderful for controlling all stored product pests and it is safe enough to eat.

Summary: Several species of stored products insects can infest dried fruit, cereal and grain products in the pantry as well as bird seed, pet foods and some types of holiday decorations. Often problems are overlooked until moths or wandering larvae alert the homeowner to the presence of a serious pest infestation. Usually, the best solution is to examine all grain products and dispose of any infested materials. Cabinets and shelving should be routinely vacuumed to remove flour and other food material from cracks and crevices that can provide these pests with a food source. Without thorough sanitation, new products will continue to become infested. Upon opening, new cereal and grain products should be stored in closed tightly sealed metal, plastic or glass containers. Occasionally, it may be necessary to try to salvage infested items such as holiday decorations or homegrown popcorn that may have a few "bugs". Low temperature

can be used to treat small quantities of dried fruit, cereal and grain products. In general, the lower the temperature, the less time that is required to kill the pests. Generally temperatures of 0 to 5 degrees Fahrenheit will kill all stages of grain insects in one day.

Treat foods with any signs or evidence of being or having been infested using cold or heat to kill any eggs or larvae that may be present. COLD - Lay food out in a thin layer then: Put items into your freezer for a minimum of three days. Alternate cold and warm temperatures: put food item in freezer for two days, take out and leave at room temperature for two days, then put back in freezer for two additional days. HEAT – Either put food into the oven at 140°F for one hour or 120°F for two hours. Stir food periodically to ensure heat penetrates all food and does not burn surfaces. Or microwave for five minutes. To kill pests on the outside of foods such as dried fruits, put them into a cheesecloth bag and put into boiling water for 10 seconds. After treating, insect fragments can be sifted from the food and it can be then eaten or used to feed birds. However, it may be just as easy to discard the infested food if it is a small amount. Once all foods are removed from pantry and cabinets, it is important to clean thoroughly to remove all food sources for any hidden or surviving pests. Vacuum or sweep all crumbs, wipe down all shelves, corners and floors. Be sure to get into corners and cracks. Do the same with all areas around the

infested area, e.g., sweep and clean kitchen floors; remove items from countertops and clean thoroughly; pull out stove, refrigerator and other appliances and sweep and clean beneath. For at least the next month, be sure that all foods are in tightly sealed containers or stored in refrigerator or freezer to ensure that the infestation is totally eliminated.

TERMITES

Worldwide, destructive termites cause roughly $40 billion a year in damages to homes and other wooden structures. Far more volatile, synthetic pesticide poison is used to control termites than any other structural pest you will ever encounter. No volatile synthetic residual insecticide or economic poison is completely effective and/or safe no matter what the professional pest control industry claims. The U. S. Environmental Protection Agency (EPA), when it approves one of the economic poisons, basically is only concerned with the harmful effects that occur from a single exposure of only the active ingredient by any route of entry or its acute toxicity expressed as its LD50 or LC50 value which is the lethal dose or concentration (relative amount) of only the active ingredient required to kill 50% of a test population, e.g., male rats. LD50 values are recorded in milligrams of active ingredient per kilogram of body weight of the test animal. LC50 values are recorded in milligrams of active ingredient per volume of air or water. Both units are the same as parts per million (ppm) which compares to 1 minute in 2 years or 1 inch in 16 miles. Inert ingredients, metabolites, contaminants, synergistic effects and chronic exposures are not evaluated, even if they are more toxic or restricted than the active ingredient.

With the ever increasing and skyrocketing violence,

asthma, heart arrhythmias or irregular heartbeats and/or heart attacks, cancer rates, pulmonary problems, health problems, neurological diseases and the rapidly accumulating data that exposes the toxic disruption of our endocrine systems that control all sexual traits, fertility and reproduction, all life as we know it is literally hanging in the balance. That is why the Author recommends that you use mechanical alteration and only sodium borate or the Author's new traps and refuse to use any volatile, synthetic residual pesticide poisons.

In the 1990s, the EPA listed over 2,518 chemicals that it allowed manufacturers to add to pesticide poison formulations as inert ingredients. Inerts can include antifreeze, wood alcohol, asbestos, solvents, stabilizers, emulsifiers and preservatives. Many synthetic residual pesticides are 80% to 99% inert ingredients. In addition, in some cases EPA allows pesticide poisons to be manufactured using recycled hazardous wastes or to contain contaminates such as DDT or dioxins.

Forty of the inert ingredients allowed by EPA in pesticide formulations are also classified by EPA as inerts of toxicological concern. This means they are: probably human carcinogens, known animal carcinogens, brain or nervous system toxins, capable of causing other chronic effects or adverse reproductive effects, or acutely toxic at concentrations of one part per million or less to some

tested species. Methyl bromide is an extremely toxic fumigant that is easily inhaled or absorbed through the skin. EPA considers methyl bromide so dangerous that it permits only certified pest control applicators to use products which contain it as an active ingredient. However, EPA has also classified methyl bromide as an inert ingredient, meaning that the pesticide manufacturers may add it to other pesticide poisons without even testing it or even listing it on the registered label! Therefore, the real dangers of these poisons is not currently accessible.

If you are chemically sensitive, the Author suggests you only try termite predators, e.g., nematodes and/or predator mites, baits, antibiotics, salts, fans, food-grade DE, dehumidifiers, rain gutters, proper grading, ventilation, moisture barriers, sand barriers, traps and/or mechanical alteration, then if you still have any pockets of resistance the only natural chemical/pesticide the Author recommends that you use is called sodium borate (or borax); it is a naturally occurring material that has trace amounts of arsenic; TIM-BOR powder has no added inert ingredients; BORA-CARE liquid also contains ethylene glycol and water; IMPEL RODS are solid borate fungicide rods. If you can not find them, spray all unfinished sole plates, sill boxes and infested wood with 1½ cups of borax per gallon of hot water 3 times to the point or run-off, letting the wood dry between each spraying. In addition, the Author also recommends you

use other non-toxic controls such as exclusion, mechanical alteration, temperature controls, biological controls, sanitation and other integrated pest management techniques. The Author is firmly committed to your safety and will always attempt to help you permanently control your pest problems with the least amount of toxin possible! ALWAYS FOLLOW THE LABEL DIRECTIONS AND REMEMBER BORAX AND/OR BORON PRODUCTS WILL NOT PENETRATE FINISHED WOOD!

What are the dangers? If you are still thinking about hiring someone to apply hundreds of gallons of some volatile, synthetic residual poison in your building - please only have them treat outside and spot treat inside only if absolutely necessary. Be very careful, especially if there is a well within 100' of any soil treatment. Do not let anyone treat your home's interior with any synthetic residual termiticides, especially if you have heat ducts in your slab or have a crawl space that is used as a plenum air space or if you have unsealed cracks or expansion joints in your slab floor or foundation, or if your blocks are visually open on top, or if anyone in your home is over 60, under 1, pregnant, chemically sensitive, allergic or has any breathing problems.

Organochlorine termiticide POISONS were are a group of pesticide POISONS that were all used for termite

control in and around wooden buildings and homes from the mid-1940s to the late 1980s. These deadly organochlorine pesticide POISONS included chlordane, aldrin, dieldrin, heptachlor, and dichlorodiphenyltrichloroethane (DDT). They were all banned or "voluntarily withdrawn".

It has now been estimated that over 75% of all U. S. homes built prior to April, 1988 are still contaminated with significant levels of chlordane - do you really want more poison contamination? When you compare the typical replacement organophosphate termiticide label with the agricultural label, you find the organophosphate termite poison label allowed the “professional” to apply over 300 times the amount of active ingredient inside your home than what was considered to be a safe application to an acre of ground outside and yet the same label stated it is unsafe and illegal to apply this diluted poison inside a barn where the animals or birds were to be used for food!

After chlordane was removed from market, organophosphates became popular formulations for termite control. Organophosphates interfere with an insect’s ability to control its movement, which renders the insect paralyzed and causes its death. Isofenphos was one type of organophosphate commonly used from 1987 – 1992. The Pryfon formula distributed by Bayer

Corporation was discontinued in 1992 due to studies suggesting the chemical might break down more quickly in some soil types and climates. The other main organophospate on the market was chlorpyrifos, which was sold under the brand names Brodan, Detmol UA, Dowco 179, Dursban, Empire, Eradex, Lorsban, Paqeant, Piridane, Scout and Stipend. These organophosphate termiticide POISONS were first introduced in 1982 and removed from market for post-construction applications in 2002. The exact reasons for chlorpyrifos® removal from the market are not known. The Author worked hard to remove both chlordane and the organophosphate POISONS from the market.

Remember that before the introduction of any of these synthetic residual economic poisons called termiticides, homes and barns miraculously stood for centuries. It is far more important to protect your health than to try to save a few 2" x 4"s with synthetic poisons that will continue to volatilize into your home for years and years and years!

Volatile, synthetic residual pesticide poisons or termiticide poisons supposedly kill or repel either by poisoning the soil or contacting the insect. This means contamination of nearby water sources and ambient air can occur and/or that toxic surface and ambient air contamination may be present for years after their labeled

and "registered" poison application. Sodium borate is applied directly to the wood, thereby eliminating most potential soil, air or water contamination. Sodium borate penetrates throughout the wood and leaves no toxic surface residue. The sodium borate is left as micro-crystals of borate salt inside the wood which will not decompose or volatilize (vaporize) like volatile, synthetic residual pesticide poisons. This means the sodium borate will keep providing you broad spectrum protection (permanently) with little impact on our environment or your health. We suggest that you (re) design and construct your home and additions to minimize moisture uptake and retention by wood; use a dehumidifier; remove all branches that overhang or touch your home; correct all earth-wood contact points; repair all cracks and crevices; thoroughly caulk, screen paint and/or seal your home, and sometimes that you replace your porches, piers and stoops with sodium borate treated and sealed lumber. Since 1953 when non-volatile sodium borate was mandated in New Zealand to be used to treat and pretreat lumber and homes and buildings, there has never been any evidence of even one successful attack of wood destroying organisms in New Zealand, no matter what the conditions. Compare this to the failure of toxic and volatile termiticide poisons routinely failing to protect our homes during the same time period and you need go no further with your choice of termiticide - but the poison

industry and the regulators ignore little facts like these.

The Environmental Protection Agency (EPA) has officially stated in court that EPA registration (and, therefore, labeled usage) does not assure safety. Current pesticide registration clearly is not designed to protect the public's health; that is why the National Academy of Science (NAS) estimates that 1 out of 7 of us is already significantly impaired by pesticides and other toxic chemicals. The National Cancer Institute studies show children get leukemia 6 - 7 times more often when pesticides are used in or even around their homes, and farmers and pesticide applicators show similar increases in cancer when exposed to these poisons. Drinking water in at least 39 states is already contaminated with these toxins. We clearly are already destroying/poisoning ourselves and the next generations!

The Inspection

A thorough, accurate yearly inspection is the most important part of any wood destroying organism control program and will ensure early detection of infestations and/or reinfestations before serious damage can occur. Before you even begin your inspection, completely read and understand this manual and become knowledgeable in the biology and habits of the various wood destroying organisms so you will know what to look for. Proper termite identification and a knowledge of the species' biology are the most essential elements in termite control. Then carefully and visually inspect all accessible areas, probe and/or sound all accessible structural members and wooden objects inside and outside your home. Be sure you look under all rocks and patio stones for subterranean termites who may be there looking for moisture and decaying organic matter. In Florida and the rest of the South (and when baiting) check every 3 months.

Be sure to write down everything you find, i.e., type of infestations, damages, inaccessible areas, conditions conducive to infestation, construction problem(s), moisture problem(s), etc. and carefully record all of this on graph paper as a permanent record. Written notes, properly recorded and properly filed away are the only things that do not forget. (Check out the forms available on The Best Control II©.)

Remember to save and properly file the results of all of your inspections so that you can compare/monitor the conditions conducive to infestation, damages and other details with each passing year. Remember you should conduct a thorough inspection at least once a year and should continue to visually monitor your home as you clean and conduct normal preventative maintenance on it. Remember to make a graph drawing of your home showing the view from above (a plan) and at least one view from the side (an elevation). This will help you find hidden and/or inaccessible areas you might otherwise overlook inside. Make several copies so you can use a fresh graph each time you inspect your home. If you decide to pay a professional to conduct these inspections for you, tell him in the beginning that whoever you pay to conduct your inspections will not be allowed to perform any treatments. This should ensure a more honest opinion on his part. Sometimes the professional will pound on the wall and then use a stethoscope (for hearing behind walls), drill holes into your wall and insert fiber-optic viewing scopes (for seeing behind walls) and/or bring in termite-detecting dogs (for smelling behind walls), but nothing beats a "live-in" inspector (you) who carefully and faithfully monitors your own home daily!

Remember, even if you find evidence of an active infestation there is no need to panic and have some professional sell you a job today or lose your home

tomorrow! While all wood destroying organisms can do some damage, there always is time to properly and thoroughly plan your control program and often there is no need for any poison control, especially volatile poisons.

Your inspection, if done properly, will allow you to decide how you can best control your wood destroying insect infestations, whether you will use exclusion, mechanical alteration, baits, sodium borate, spot or overall applications, traps, heat or cold treatments, biological controls, salt, dehumidifiers, fans, vents, air conditioning, vapor barriers, medications, Peladow®, borax, Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint or various dusts, alternative borate products, sanitation, or a combination of these or other controls.

A key difference between sodium borate (or borax) and traditional synthetic residual chemical termiticides is that rather than treating the soil or fumigating, sodium borate can be injected, sprayed, fogged or brushed directly on/into bare wood. It penetrates into the wood so that more than just the surface is treated, and because sodium borate does not decompose or change with time, true long-term protection is provided. The product is ideal for wood that is not in contact with the ground and not exposed to rain or excessive standing water. Native

subterranean termites are killed with only 1,000 ppm of boron in wood. Formosan termites are killed with 2,000 ppm of boron in wood. Dampwood and drywood termites are killed with 1,000 ppm of boron in wood. Where you have a steady, severe plumbing leak or moisture problem, it should be repaired before sodium borate is applied. Moisture is a key factor in the mode of action of sodium borate. The higher the moisture content of the wood, the faster sodium borate (or borax) diffuses into it and the deeper its penetration. In addition to treating the wood you can also treat sawdust, wood pellets, tongue depressors, scraps of wood, (rolls of) corrugated cardboard etc. with 3% or less sodium borate and use them as baits and/or pre-baits. If you get some on glass, quickly remove the residue with soap and hot water.

Vacuum up all termite swarmers. Check all wood with a moisture meter.

Soak all the damp and/or infested and/or exposed (unfinished) wood with 1 - 1½ cups borax (and ½ cup Safe Solutions, Inc. Enzyme Cleaner with Peppermint) in 1 gallon of hot water at least 3 times to the point of run-off.

Remove all earth/wood contacts, roots and foam board insulation.

Install and properly maintain dehumidifiers, vents, fans, eaves and downspouts.

Prebait with virgin cardboard wrapped in plastic, but opened at the bottom. Once you have termites in your bait, lightly mist some new cardboard with 3% or less TIM-BOR® or borax or diluted Flagyl®. Shake some termites from the infested station into the treated station and then replace in the ground. Continue to replace with new, treated bait stations as needed. Food-grade DE applied under the slab or on the crawl surface will permanently control termites.

Because of the serious damage they can cause to wooden structures, termites are among the pests most feared by homeowners. However, swarms of flying termites do not always mean your building is infested. A careful inspection of the structure is required to confirm an active infestation. People also frequently mistake swarms of flying ants for termites. If you suspect that your house is infested, call a professional. Do-it-yourself sprays cannot be relied on to reduce a damaging infestation. Common termites are the subterranean termites that build nests in soil, dampwood termites that nest in moist wood and soil, and drywood termites that nest above ground in dry wood. Management of each termite species is different. The Author is currently working on an EPA exempt termite bait station.

Distinguish flying ants from termites:

Check the antennae, wings and waist to confirm that pest

insects actually are termites.

Design your building to keep termites out:

Keep a 12-inch barrier of smooth concrete, sand, or other material between the soil surface and substructure wood beneath a building.

Choose termite-resistant wood for fences or other structures that must contact soil.

Remove wood piles, untreated fence posts and buried scrap wood near structures.

Provide adequate ventilation to substructures and keep them dry.

Immediately repair foundation cracks.

If termites are invading your home:

Destroy shelter tubes that subterranean termites build between soil and wood structures.

If dampwood termite nests are accessible, remove infested wood and eliminate excess moisture.

Drywood termites can be controlled with heat, freezing, electricity, microwaves, fumigation, or spot treatments of chemicals.

Using pesticides for termite control:

The Author has inspected homes so contaminated with soil "treatments" they had to be evacuated but the termites were still eating the structure.

Properly treat the wood with sodium borate or borax for permanent control.

Baits can be effective but may take several months to control the problem and must be followed up with constant monitoring.

Want to get rid of the termites gnawing on your floorboards? Just do like they do in South America and Africa: Take advantage of the rich nutritional quality of these insects by frying, sun-drying, smoking or steaming termites in banana leaves. Termites generally consist of up to 38 percent protein, and one particular Venezuelan species, Syntermes aculeosus, is 64 percent protein. Termites are also rich in iron, calcium, essential fatty acids and amino acids such as tryptophan.

THRIPS

When thrips feed, they distort or scar leaves, flowers, or fruit. Healthy woody plants usually tolerate thrips, although damage can become unattractive. Herbaceous ornamentals and developing fruits and vegetables can suffer more serious injuries. Use an integrated program combining good cultural care, pest exclusion, planting thrips-resistant species, and protecting natural enemies by using least-toxic insecticides.

Thrips are tiny, slender insects with hairs on their wing margins.

They are less than 1⁄20 inch long, and their color varies depending on the species and life stage.

Thrips hatch from eggs and develop through two feeding larval (nymphal) stages and two nonfeeding stages (prepupa and pupa) before developing into adults.

Certain thrips are beneficial predators of some insects and mites.

Most pest thrips feed while hidden, often in buds and shoot tips or beneath sepals; you'll often observe the damage before seeing the thrips.

Greenhouse thrips and western flower thrips are two common pest species in landscapes.

Damage often isn't apparent until tissue grows and expands. Look for:

Scabby, silvery to dark brown discoloration on fruit, leaves, or petals.

Dark specks of excrement on fruit or leaves.

Distorted, curled, galled, or dead shoot tips and leaves.

Check for thrips before you treat!

Be certain that pest thrips are present and causing damage before taking control action. Harsh weather, inadequate plant care, pathogens, and other invertebrates can cause similar-looking damage. Shake foliage or flowers over white paper to see if this dislodges any thrips. Hang bright yellow sticky traps to detect flying thrips.

Thrips are difficult to control. Combine methods in an IPM program:

Find out what species you have and research the best approach..

Conserve parasites and predators by avoiding the use of any persistent pesticides..

Avoid overwatering or applying nitrogen fertilizer, which can increase thrips populations.

Prune off declining, injured, or infested plant parts.

Apply row covers or cages over small plants to exclude thrips.

Cover soil with reflective mulch, which repels flying thrips if foliage covers less than about half of the soil surface.

Here again, the Author believes that one of the simplest and most effective controls is a solution of (1 oz. per 2 quarts) Safe Solutions Tweetmint Enzyme Cleaner and water.

Pesticide POISONS

Pesticide POISONS won’t restore the appearance of injured tissue. Plants remain damaged until injured tissue drops or is pruned off and new growth appears. Thrips are difficult to control with pesticide POISONS. Often pesticide POISONS won’t be effective unless you wait until the next season and spray new growth. Horticultural oils, insecticidal soaps, and Safe Solutions Tweetmint enzyme cleaners can provide temporary control, especially for greenhouse thrips. Pesticide POISONS alone rarely provide good control, so combine spraying with other methods.

TICKS

Ticks are not insects; they belong to the class Arachnida, which also includes mites, spiders and scorpions. Ticks differ from insects in that they have one body region, eight legs and no antennae. Ticks are the largest members of the order Acarina and are virtually the only members of that order you can see without magnification. The order Acarina (ticks and mites) to which they belong differ from other arachnids in that their bodies are not conspicuously segmented, but the abdomen and cephalothorax are fused into one body region. They can not fly, run, hop or jump; they climb up and perch on an object until some host passes by; then they either climb on or fall on to the unfortunate creature. They feed entirely on blood of vertebrates with their barbed, piercing organs; they take a firm grip on the skin and suck blood for anywhere from 15 minutes to several days - they keep on drinking until they are full.

Ticks are further divided into two families: hard ticks in the family Ixodidae, and soft ticks in the family Argasidae. Hard ticks have a hard, smooth shield on their backs and are tapered at the front with an apparent head; they are the ticks most readily recognized by most people. Female hard ticks feed once and lay as many as 10,000 eggs or more. Soft ticks lack the shield-like plate on their upper surface, have a tough, leathery, pitted skin

and no distinguishable head and look like animated pieces of bark or debris. Some soft tick females can feed several times and lay 20 - 50 eggs after each meal. Both groups can swell to considerable size after a blood meal. Ticks have 4 stages in their life cycle: egg, larva, nymph and adult.

Examine all of your pets' and livestock's heads, especially around their ears and necks daily for engorged ticks. Keep vegetation, weeds and brush mowed and closely trimmed. Avoid infested areas. Remember ticks cannot burrow through your clothing, so always wear protective long-sleeved shirts and trousers when visiting infested areas; tuck your pant legs into your socks. Closely inspect for ticks on your own or others skin or clothing every few hours. Their favorite places to attach to people are on the legs, thighs and groin, in armpits, along the hairline and in or behind ears. Don't be modest when inspecting for ticks. Remember the ticks may be very small, so look for new "freckles". Vacuum baseboards and other cracks and crevices thoroughly to remove and destroy eggs and all other stages. The best way to remove an attached tick from people or pets is to grasp the tick with a pair of tweezers or forceps as close to the head as possible and gently but firmly pull the tick straight off. Do not heat or pinch the tick with your gloved fingers, tweezers or forceps as this may inject the contents of the tick into the wound. Apply an antiseptic to the bite. Save the tick in a

small vial of alcohol so it can be identified.

Ticks are of great medical importance because of their ability to act as vectors of five major groups of organisms which cause disease in humans (bacteria, viruses, rickettsiae, spirochetes and protozoans). Ticks can also cause a condition known as tick paralysis. The 30,000 cases of Lyme disease reported to the Centers for Disease Control and Prevention (CDC) each year are just the tip of the iceberg. According to a new CDC estimate, more than 300,000 Americans are diagnosed with the tick-borne disease each year. The new number was presented at the 2013 International Conference on Lyme Borreliosis and Other Tick-Borne Diseases, being held in Boston. Although Lyme disease has been diagnosed in almost every state, most cases reported to the CDC are in the Northeast and upper Midwest—96% of cases come from 13 states. Lyme disease is a zoonotic disease, meaning a disease spread between animals and humans. It is caused by a bacterium called Borrelia burgdorferi, which lives in mice and deer. These corkscrew-shaped bacteria, called spirochetes, get into black-legged ticks when they feed on an infected animal. They migrate to the tick's salivary glands, and, if the tick bites a person, are injected into the bloodstream. An excellent illustration by The Boston Globe depicts this life cycle. In some people, the immune system destroys the bacteria before they can do any damage. In others, they grow and multiply, causing an

infection. Symptoms include a bull's-eye-shaped rash, fever, headache, and fatigue. Treatment with antibiotics can usually prevent any short- or long-term repercussions, says Dr. Shmerling. If the infection isn't treated, problems can develop in other parts of the body, including the joints, heart, and nerves. It can also cause arthritis that persists months or years after the tick bite. Some people with Lyme disease and some doctors have argued that Borrelia burgdorferi can somehow evade courses of antibiotics and become a chronic infection that needs long-term antibiotic treatment—even though conventional antibody tests are negative. Chronic Lyme disease has been blamed for causing pain, fatigue, muscle aches, loss of memory and thinking skills, and a host of other problems. A Boston Globe series, "Bitten By Uncertainty," has been exploring this controversial side of Lyme disease. DEER aren't the only ones to blame: We have to stop blaming the deer. Two of the most common transportation methods for deer ticks? Not the deer but birds and the white footed mouse. And we need more research into mosquitos as vectors of Bartonella. So, no matter where you live, even in an urban apartment, if you get ANY flu like symptoms in the summer, just assume it's a tick borne illness and find a doctor that will treat you properly. Don't trust that your family doctor has the education YOU need.

Prevention is key for you!

Like most communicable diseases, Lyme disease is largely preventable, says Dr. Shmerling. Avoid being bitten by a blacklegged tick (also known as a deer tick) and you won't get Lyme disease. There are two main ways to do that—stay out of brush and high grass in and around wooded areas, or get out in nature and protect yourself. Here are six tips for protecting yourself from ticks, adapted from the Connecticut Agricultural Experiment Station's comprehensive handbook about tick management.

1. Wear light-colored clothing. Light colors make ticks easier to spot, especially tiny deer tick nymphs.

2. Tuck your pants inside your socks. It may not be a flattering look, but it creates a physical barrier against ticks.

3. Use insect repellent. Most of the chemicals that repel mosquitoes are somewhat effective against ticks, although it may take a heavier concentration of DEET—between 30% and 40%—to really keep them away. Permethrin is a stronger chemical that kills ticks as well as repels them. Products containing permethrin should be sprayed on clothes, not on the skin. Picaridin repels mosquitoes and other insects but not ticks. Dust your legs, stockings, pants and foot gear with baby powder or Safe Solutions food-grade DE.

4. Stay in the middle of the path (or fairway). Ticks can't

fly or jump, so they can only get on you if you come into contact with the kind of environment they live in: moist, often shady, wooded areas, with leaves, low-lying plants, and shrubs.

5. Think sunny. Ticks don’t do well in dry, open areas. Lawn furniture and playground equipment should be set back from the edge of wooded, shady areas. If you’re picnicking, pick a patch of well-tended lawn or some open ground.

6. Inspect yourself and your children (and your pets), especially the legs and groin. Ticks usually get picked up on the lower legs and then climb upward in search of a meal. The odds of contracting Lyme or other tick-borne disease are minimized if a tick is removed soon after it’s attached, and there’s no risk if it’s still crawling around. The shower is a good place to conduct a tick check. Feel for any new bumps on soaped-up skin. Do not be modest!

And if you do get bitten by a tick, remove it using the method recommended by the CDC: Use a pair of fine-tipped tweezers to grasp the tick as close to the skin as possible. Then pull it out with a steady motion. Once the tick has been removed, clean the skin with soap and water. Dispose of the tick, which is probably still alive, by placing it in alcohol or flushing it down the toilet. Don’t fall for “home remedies” like covering the tick with Vaseline or touching it with a just-blown-out match.

If you are bitten by a tick, seek immediate medical attention.

Ticks are extremely dangerous external parasites of warm-blooded animals, birds, reptiles, amphibians and man. Their bites are not only annoying and painful but may result in localized skin inflammation, secondary infection and possible introduction of disease-causing microorganisms or pathogens. Some ticks are venomous and produce very painful bites and some ticks cause tick paralysis and lameness in people and animals. Both males and females feed on blood. Male ticks generally die shortly after mating. Because tick movements and bites are seldom felt, you must carefully and frequently examine for ticks on your own body and clothing. Early tick removal is important since many disease organisms are not transferred until the tick has fed for 2 - 8 hours. More than 65 disease-causing pathogens are now known to be transmitted by ticks, making this group of parasites one of the most dangerous from the perspective of human and domestic animal health.

To control ticks on pets:

Inspect at least daily. Wash routinely with Safe Solutions, Inc. Pet Wash or their Enzyme Cleaner with Peppermint if pets are found frequently infested, try using some food-grade DE rubbed into their coats. Dogs should be protected with volatile pesticide products only if they

roam freely in tick habitat. Do not touch treated pets. An alternative is to wash your pet with Safe Solutions Pet Wash or with water and natural soap, or 1 - 2 oz. Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint per quart of water and/or you can use a herbal rinse - put 2 pounds of fresh or dried rosemary in a ½ pint of boiling water, steep for 20 - 25 minutes, strain, allow to cool and rinse your pet with the cooled liquid - do not towel off, simply allow to air dry or use a hair dryer. Be sure your pets are dry before letting them outside. Try using menthol as a personal and/or pet tick repellent. As a last resort, carefully rub food-grade diatomaceous earth into their fur per label directions.

Advise that all uncontrolled or ownerless dogs be regulated and/or impounded.

Use of flea and tick collars not only have variable results but also can be dangerous to people and pets.

Cats do not currently appear to be at risk from Lyme disease nor are they hosts for RMSF vectors.

Keep pets confined within your own mowed areas.

To control ticks in yards and buildings:

Lightly dust with food-grade DE and place duct tape (sticky-side up) wherever you suspect ticks as this should help control ticks in buildings.

Lightly dust or grid your yard with 2" wide strips of food-

grade DE.

Plant mint, sweet woodruff, rosemary, and lavender. Also try placing cedar chips in your garden. They smell great to you … but not to most fleas and ticks!

Do not forget to flood the infested area with diluted (1 oz. per quart) Safe Solutions Tweetmint Enzyme Cleaner with Peppermint.

Tick summary - Lyme disease caused by a spirochete, Borrelia burgdorferi, a corkscrew-shaped kind of bacterium. The spirochete is transmitted to humans and other animals by the feeding activities of certain ticks. Only the western blacklegged tick, Ixodes pacificus, is thought to be responsible for transmitting the spirochete to people. First recognized in the mid-1970s in Lyme, Connecticut, Lyme disease has been reported in the United States, Canada, and in many European and Asian countries. All ticks have four life stages: the egg and three parasitic stages that feed on the blood of vertebrates, two immature stages (larva and nymph), and the adult stage. The tiny nymphs, which are about the size of a poppy seed, readily attach to people. Nymphs may be encountered in a variety of habitats, but they are particularly accessible and plentiful in leaf- and fir-needle litter areas in certain types of dense woodlands, for example oak forests. Unlike the adult ticks, the nymphs do not climb onto low vegetation while seeking a blood

meal. Instead, they live within litter on the forest floor, and they climb on logs and the basal portions of tree trunks up to a height of about 3 to 4 feet, so any activity that places people in direct contact with shed leaves, fir needles or wood debris (such as gardening, gathering firewood, picnicking, sitting on logs or against tree trunks, woodcutting) may elevate the risk of contracting Lyme disease. Nymphs are especially attracted to lizards but also feed on birds or small mammals. Once they attach to a person, the nymphs feed for several days before they detach and drop off. They molt to the adult stage weeks or months later.

Adult ticks seek their hosts from late fall to spring, but are most active during winter. They climb low vegetation, such as grass or brush, and lie in wait for hours or days while seeking their preferred medium- to large-sized hosts, such as rabbits, dogs, or deer. Consequently, humans incidentally encounter adult ticks during recreational activities or working in various types of grassland or brushland habitats. In one study, about 85% of the adult ticks that infested the clothing of people walking through grassland did so between their ankle and the knee. Therefore, when outdoors, individuals should frequently inspect their pant legs to detect and remove ticks before they have a chance to attach to skin. After attaching to a host, adult females ingest blood for about a week, engorging up to nearly four times their original

bodily length. They then drop off the host and eventually deposit about 900 to 1,000 eggs in soil or litter. Adult males rarely attach to people, feed little, and therefore are unimportant as transmitters of disease organisms to humans or other animals.

For light-skinned persons, Lyme disease begins in up to 60 to 80% of patients as a slowly expanding, reddish rash known as erythema migrans 3 to 32 days after the bite of an infectious tick. The rash, if present, may not easily be seen on dark-skinned patients. At least 50% or more of Lyme disease patients do not recall having been bitten by a tick. Attached nymphal ticks are particularly prone to be overlooked because of their smaller size and reduced feeding time as compared with adult female ticks. The rash typically begins at the location the tick attached, and it may expand slowly to several inches in diameter before disappearing within 3 to 4 weeks. Antibiotic treatment hastens disappearance of the rash, which with treatment may vanish in about a week. Many victims experience fatigue, headache, fever, chills, and other flulike symptoms during the initial stage of illness. Days to weeks later, a variety of other clinical manifestations may occur singly or in combination. These can involve the skin (multiple secondary rashes), musculoskeletal system (migratory pain in joints, tendons, muscles, or bones), neurologic system (severe headache, facial palsy, memory loss), lymphatic system, heart, eyes, liver,

respiratory system, or kidneys. Finally, untreated late (disseminated) Lyme disease normally begins months or years after infection, and may result in arthritic, neurologic, or further skin manifestations.

Dogs are susceptible to Lyme disease and may develop arthritis or lameness, lethargy, loss of appetite, disease of the lymph nodes, or other clinical conditions after being infected. Other animals including cats, horses, and livestock can become infected with Borrelia burgdorferi, but rarely develop clinical signs. Consult a veterinarian if you suspect that your dog has Lyme disease. Besides the bacteria that cause Lyme disease, various ticks occasionally transmit at least eight other microbial disease agents, such as those causing relapsing fever, Rocky Mountain spotted fever, tularemia, Colorado tick fever, or babesiosis. Mounting evidence indicates that the western blacklegged tick is the primary transmitter of the bacteria that cause another emerging disease, human granulocytic anaplasmosis, which sometimes is fatal. Thus, if a tick is tested for presence of Borrelia burgdorferi and is found to be uninfected, the possibility still exists that it could have been infected with another disease agent. See the Centers for Disease Control and Prevention Web site for more information on other tickborne diseases.

Treatment

Consult a physician promptly if you or a family member experience an illness that might be compatible with a diagnosis of Lyme disease. Commonly used antibiotics usually cure Lyme disease if administered within the first few weeks of infection. Be sure to follow a course of antibiotics with a course of probiotics like acidophilus to reduce the chance of yeast infections. If treatment is delayed, the disease may progress to arthritic, neurologic, or cardiac problems weeks to months later. A vaccine to protect against Lyme disease was approved for human use in December 1998, but decreasing sales, high cost, litigation, and other factors resulted in its withdrawal from the commercial market by early 2002.

PREVENTION - If you spend much time outdoors in tick-infested areas, you can significantly reduce the risk of disease by taking a few simple precautions.

Know How to Recognize the Western Blacklegged Tick - In its unfed state, the nymph is about the size of a poppy seed (1/25 inch long). It has four pairs of legs, a dark brownish-black plate on its back, and a light-colored, translucent abdomen. The unfed adult female is about 1/8 inch long, has long mouthparts, brownish-black legs, a dark brownish-black plate that covers the anterior half of its back, and a reddish-orange abdomen. Attached females feeding on a host may expand to 3/8 inch in

length, or longer. At 1/10 inch, adult males are smaller than females, somewhat oval shaped, and brownish black.

Know Where the Ticks Occur - The western blacklegged tick nymphs abound in hardwood forests or woodlands carpeted with leaf litter or fir needles, but they are much less abundant or accessible in more open habitats such as grassland. The adults are commonly encountered in open grass or chaparral (brushlands), and along the margins of trails.

Know When Ticks Occur - People are more apt to be exposed to the adult ticks at certain times of day (e.g., early morning/late afternoon on clear, warm days) because adult tick activity is positively associated with relative humidity and negatively associated with temperature; in fringe areas where two vegetational types merge (e.g., where grassland abuts with either brush or forest); and, in hilly areas, on low vegetation bordering the uphill versus the downhill margins of hiking trails, and occasionally on southern versus northern-facing slopes. Thus, simply minimizing or avoiding prolonged contact with either grass or brush when these conditions apply will greatly reduce one’s exposure to the adult ticks.

Dress Appropriately - Wear full-length pants and a long-sleeved shirt in tick-infested areas. Ticks are easier to spot against light-colored clothing. Tuck your blouse or

shirt into your pants, and tuck pant legs into boots or socks.

Consider Repellents - As an added precaution, commercially available repellents can be sprayed on skin or clothing.

Perform Tick Checks - Inspect your clothing and exposed skin for ticks very often when outdoors in likely tick habitats. Ticks may attach anywhere on the body, but on fully clothed persons they often attach to the scalp, behind an ear, or to an arm or leg. Pay particular attention to these areas when examining yourself or others. Furthermore, examine your bedding for up to several days after exposure to tick-infested habitats for presence of detached, fed ticks. Nymphs of the western blacklegged tick, once attached to human skin, are easily overlooked because of their small size and sometimes hidden feeding sites (such as the scalp). However, fully satiated nymphs have been observed to detach from people during the night within as few as 3 days after exposure to ticks, and they are much easier to detect in a bloated state while digesting their blood-meal among bedclothes, including one’s pillow.

Check Your Pets - After they have been outside dogs and cats can carry ticks indoors. Wash them with Safe Solutions Pet Wash and/or their Tweetmint Enzyme Cleaner.

Reduce Tick Abundance - Make the landscape less hospitable for ticks e.g., clearing leaf litter and/or creating woodchip barriers between lawns and adjacent woodlands, could prove useful. For an excellent, comprehensive overview of tick management strategies, organic land care practices, personal protective measures, and chemical control methods, the interested reader is referred to the state of Connecticut’s Tick Management Handbook.

Tick Removal

If you find an attached tick, remove it immediately. Prompt removal of infected ticks can prevent Lyme disease and other tickborne diseases. Although research suggests that Ixodes pacificus nymphs require about 2 or more days of attachment to begin transmitting Borrelia burgdorferi to a host, other tickborne agents (such as Colorado tick fever, Rocky Mountain spotted fever) may be transmitted within the first day. Grasp the tick as close to the skin as possible with a pair of tweezers. If tweezers are unavailable, use your fingers, but protect them with tissue paper. Be careful not to squash a fed or partially fed tick because some tickborne agents may be transmitted through broken skin. Slowly and steadily pull the tick straight out. Remove any mouthparts that break off in the wound (consult a physician if necessary). The mouthparts may be contaminated with other bacteria that occasionally cause secondary infections, but the mouthparts alone will not transmit Lyme disease spirochetes. Do not jerk or twist the tick as you extract it. Do not apply alcohol, fingernail polish, heat from a lit match, or petroleum jelly to the tick; these methods are completely ineffective. Clean the wound with soap and water. Apply a mild antiseptic such as povidone-iodine, if available.

Testing Ticks for Disease - Whenever an attached tick is

removed from a person, it should be saved for later identification in case the person experiences an illness within a month. Most people who contract Lyme disease or other tickborne diseases usually become ill within 1 to 2 weeks after having been bitten. Acarologists (scientists who study ticks and other mites), entomologists, or public health biologists employed by governmental agencies (e.g., state and local health departments, mosquito and vector control districts) or universities may be available to assist you with tick identifications. Ticks also can be submitted to certain commercial laboratories or governmental agencies for testing for presence of Borrelia burgdorferi. Depending on the specific test performed (e.g., IFA, PCR) in a given laboratory, ticks may have to be submitted either alive or preserved in isopropyl alcohol.

TREE BORERS

Wood-boring insects are among the most destructive pests of ornamental trees and shrubs. Borers are the larvae, or immature stage, of certain moths and beetles. They tunnel and feed under the bark in living wood, destroying water- and sap-conducting tissues. This causes girdling, branch dieback, structural weakness, and decline and eventual death of susceptible plants. Infestation sites also provide entry points for plant pathogens. Clearwing and flat-headed borers are the two main types that attack woody ornamentals. These groups differ somewhat in their habits and host preferences, but similar management tactics are used for both. The keys to controlling these pests are to keep plants healthy and, if necessary, to treat during those brief times of the year when the insects are vulnerable to your sprays. Borers rarely infest healthy plants growing in their natural environments. However, when trees or shrubs are transplanted into the landscape, stresses such as drought, soil compaction, sun scald, or injuries can weaken them and make them more susceptible to attack. Research has shown that the adults may locate suitable egg-laying sites by responding to volatile chemicals that emanate from stressed trees. Adult borers emerge from infested trees in the spring or summer. After mating, the females fly to a suitable host and lay eggs on the bark, often in crevices or around

wounds. Hatching occurs about 10 days to 2 weeks later, and the young larvae quickly tunnel beneath the bark where they feed and grow. Once inside the tree, borer larvae are no longer vulnerable to insecticide POISON sprays and are seldom detected until serious damage has been done.

Several species of clearwing and flat-headed borers can infest landscape plants. While some are attracted to a wide range of hosts, most attack only particular kinds of trees and shrubs. In order for treatment to be effective, it is important to know when the adults of each species are active and which plants are vulnerable. A number of different types of insects may bore into tree trunks and branches in their larval stages, producing sawdust or sap-filled holes and weakening trees. Most borers can successfully attack only trees that have been stressed by under- or over-irrigation, disease, lack of proper care, or injury by mechanical equipment. Usually by the time the tree is infested with borers, there is little you can do to manage them other than improve tree vigor, prune out infested branches, or remove the tree. Insecticide POISONS are occasionally used to prevent infestations of bark beetles on high-value trees or to manage certain clearwing moths.

To avoid a borer attack, keep trees healthy:

Plant only species adapted to your area.

Irrigate trees properly and separately from the lawn.

Avoid injuries to trunks and roots.

Protect tree trunks and branches from sunburn.

Avoid pruning trees when borer adults are flying, usually late winter through late summer.

Replace old declining trees.

Monitor tree trunks and branches regularly to detect infestations before they become serious.

If borers are in your trees, identify them correctly:

Effective management practices vary according to species.

Confirmation of species requires finding the insect, although knowing symptoms and host plant species can help.

Many tiny holes in tree trunks and branches may indicate bark beetles; larger open tunnels filled with sawdust-like frass indicate clearwing moths; flatheaded or roundheaded borers leave wet spots and dark stains and D-or 0-shaped emergence holes.

Call your Cooperative Extension office or California County Agricultural Commissioner for help in identification or refer to the UC Statewide IPM Program Web site.

Nonchemical ways to manage tree borers:

Follow the guidelines above for keeping trees healthy.

Local infestations of bark beetles and other boring beetles on branches may be pruned out.

If the main trunk is extensively bored, remove the tree and focus on protecting neighboring trees of the same species.

Clearwing moth larvae may be killed by probing tunnels with a stiff wire.

Clearwing moth larvae may also be killed with applications of beneficial nematodes in the genus Steinernema.

Should you use insecticide POISONS?:

Seriously affected trees cannot be saved with insecticide POISON treatments and should be removed.

Safe Solutions Tweetmint Enzyme Cleaners with Peppermint sprays must be applied to kill adults as they are laying eggs on trunks and branches of trees before they are seriously infested. Careful timing is essential for success.

No insecticide POISONS are effective against larvae within trees, including systemic insecticides such as acephate or imidacloprid.

WEEDS

Nothing disturbs tidy gardeners more than a weed-filled flower or landscape bed. Weeds will invade any bare or thin area in a landscape. Prevent invasions in new beds with good site preparation. Keep weeds out with an integrated program that includes competitive plants, mulches, and hand removal. Be particularly vigilant about removing aggressive perennial weeds. You never need herbicide POISONS in established landscape plantings.

Before and right after you plant:

Prepare the site and control existing weeds.

Dig out weeds or remove by hand. If you have time, follow up by irrigating then removing newly emerged weed seedlings right before planting.

Solarize the soil if time allows.

If necessary, use glyphosate or other systemic herbicides for difficult-to-control perennials.

Evaluate your soil and amend if needed. Make sure new soil comes from a reputable source and doesn’t contain weed seeds.

Establish new plantings as quickly as possible to cover bare areas and shade out weeds.

Consider drip irrigation in permanent plantings.

Apply mulches.

Mulch is the key to weed-free landscaping.

Mulches prevent weed seed germination by obstructing sunlight. Be sure to properly apply mulch and replenish it to maintain its effectiveness.

Organic mulches (e.g., wood chips, bark chips, compost): Attractive but must be replenished. Choose a medium-sized mulch (3/4 inch) and maintain it at an adequate depth (3 to 4 inches).

Natural inorganic mulches (e.g., sand, gravel, pebbles): More stable than organic mulches, but difficult to keep clean.

Landscape fabrics: Porous and long lasting; vary in how long they remain effective. Cover with organic mulch.

Black plastic: Not recommended since it can restrict air and water movement and promote root rots.

When weeds invade your landscape:

Remove small weeds by hand before they set seed.

Use a dandelion knife or similar tool to dig up and destroy all roots and underground parts of perennial weeds without disturbing the soil.

Use shallow cultivation or hoeing to remove annual weeds from ornamental plantings.

Consider devices such as string trimmers for large landscapes.

Apply mulch to weed-free areas to prevent further invasions, and regularly remove new weeds as soon as they emerge.

Forget about herbicide POISONS

In general, existing landscape plantings don’t need herbicides; hand weeding and mulching usually provide adequate control.

Herbicides can injure desirable plants in landscape plantings, so use these products with great care.

Weeds occur in all lawns but seldom become problems in well-managed, healthy turfgrass. Poor maintenance practices—such as improper fertilization, watering, and mowing—can weaken turfgrass and predispose it to weed invasion. Total eradication of weeds isn’t realistic or necessary for most lawns. With good management practices, a lawn can be vigorous and attractive with no herbicide use.

Why is weed identification important?

Different weeds require different management approaches.

Many weed species are associated with a lawn care condition such as overwatering, compacted soil, or low fertility.

Identifying the species present can give an indication of the underlying lawn care problem, which can be

corrected.

For help identifying weeds, go to www.ipm.ucdavis.edu/weeds.

Prevent weed invasions with proper lawn care.

Make sure you are growing an appropriate turfgrass species for your area.

Regularly check sprinkler heads.

Water deeply and infrequently.

Mow regularly, and remove no more than one-third of the leaf blade at each mowing.

Fertilize up to four times a year with no more than 1 pound of actual nitrogen per 1,000 square feet per application. The Author recommends composted chicken manure.

If needed, alleviate soil compaction with aeration.

Remove thatch if it is more than half an inch thick.

When weeds invade:

Identify the weed species.

Determine if there is an underlying lawn care problem, such as improper irrigation or a soil deficiency or mowing problems or inadequate fertilizer, and correct it.

Remove weeds by hand as you see them, when they are young and before they flower, set seed, form vegetative parts, and spread into patches.

Fertilize and then overseed.

Avoid fertilizer products containing herbicides.

Renovate or replace weak areas of lawn with vigorous new turf.

The best defense is often a good offense. This means keeping the lawn thick and healthy to keep weeds from having any room to grow. You can also add groundcover plants and other thick plantings to crowd out weeds in decorative beds. Mow your lawn high and organically fertilize with composted chicken poop to keep the lawn as competitive as possible. Reseed your lawn in the fall to prevent weed growth. Since many weeds are already dead late in the season, there is less competition for space as grass seeds try to take root. Smith also recommends strong, high-quality grass seed. Look for the highest germination and purity percentages available. Once you have put in desirable plants that crowd out weeds, keep your plants healthy with fertile, aerated and well-drained soil. Test your soil and talk to local specialists to create the optimal fertilization plan. Unfortunately, weeds can grow in virtually any soil, but soil improvements will at least create a level playing field with your plants. Soil compaction is a concern under lawns, but can be overcome with a core aeration every three or four years.

Hoeing can be very effective for controlling annual weeds. However, perennials often re-sprout from the

roots after the tops are removed. Hoeing should consist of short, shallow strokes that simply cut off the weeds at soil level, hoeing deeper will only bring more weed seeds to the germination zone and may injure the roots of desirable plants growing nearby. Tom Lanini, a professor of plant sciences at the University of California Davis, said mulch is the most important factor in preventing weed growth. Nearly any barrier that blocks light works as a mulch. Bark and other decorative mulches work, but dried leaves, cardboard and newspapers are also effective. Landscape fabrics are thin barriers covered with tiny holes. They are typically made of plastic, but may also be sheets of burlap or other natural fibers, or recycled plastics. They are effective at blocking weed growth while allowing water and air into the soil. They should be used in conjunction with thick, effective mulch. As a garden mulch, fabrics do provide good early-season weed protection. However, because fabrics allow some light to penetrate, weeds will germinate below and break through the cover unless some other material, such as rocks or bark mulch, are placed on top. Solid plastic sheets are another alternative for covering the ground and blocking growth of weeds (and other plants). The plastic blocks water and light penetration killing the plants underneath. This is also known as solarization. It is a fast and effective way to kill grass before replacing it with a vegetable garden or different type of lawn. Clear plastic

should not be used since it allows light to penetrate, resulting in germination of weed seeds and excessive heating. Most plastic is derived from petroleum, and may be even less organic than chemical sprays.

You will never completely prevent weed invasions. However, you can keep them from getting deeply established and spreading. Keep an eye on weeds and pull them before they can go to seed. For many species, you have days or weeks of growth before weeds flower and distribute seeds. For example, if you want to get rid of dandelions, pull them before the flowers turn into puffballs and blow around the yard. A single dandelion plant can produce 15,000 seeds each year, and each seed can survive for up to six years in the soil. Ants will remove most weed seeds so do not kill them in your yard. You can torch weeds with small landscape flamers, which are hooked to standard propane tanks. Remember that the flames kill the weeds long before the weeds are reduced to ash. The Author suggests pinching the weed leaf with a thumb and forefinger. If it leaves a fingerprint, the weed is dead. Herbicides aren’t all made of nasty chemicals. Organic soaps, plant oil blends and even common household products are all used as natural herbicides. Concentrated vinegar is perhaps the most common. Drenching targeted weeds with vinegar can kill them, without any risk of toxic runoff. It is not selective, meaning it may kill everything it strikes. It also may be

dangerous. Avoid eye contact and always follow label directions, even with natural herbicide products. Also consider controlling your reaction to weeds. Some homeowners and even experts suggest a live and let live philosophy, so to speak.

WHITEFLIES

Minute sucking insects with powdery white wings; whiteflies rest in huge numbers on leaf undersides and fly out in clouds when disturbed.

Larvae

Flattened, legless, translucent, 1/30-inch scales on leaf undersides.

Eggs

Gray or yellow cones the size of a pinpoint.

Commonly found in greenhouses throughout North America; also found outdoors in warm regions of California, Florida, and Gulf states, and areas on the West Coast.

DAMAGE

Nymphs and adults suck plant juices from citrus, greenhouse foliage plants, ornamentals, and vegetables. Their feeding weakens plants; they also secrete a sticky, sugary substance called honeydew. Sooty mold, a black fungus, grows on the honeydew-coated leaves and fruit. Whitefly feeding can also spread viral diseases.

LIFE CYCLE

Females lay eggs on undersides of leaves; these hatch in 2 days into tiny, mobile scales; while continuing to feed on plant juices, scales molt to a legless stage in a few days. After several growth stages, nymphs rest in a sort of pupal stage before emerging as adults. Most whitefly species require 20 to 30 days for a complete life cycle at room temperature, fewer in summer. Numerous overlapping generations per year, continuing all winter in greenhouses and warm climates. In cold-winter areas, whiteflies can only infest plants outdoors during warm summer weather; cold weather will kill them off.

CONTROL

Catch adults on yellow sticky traps; vacuum adults from leaves; remove infested leaves; indoors, release Encarsia formosa parasitic wasps to control greenhouse whitefly; outdoors, attract native parasitic wasps and predatory beetles; spray with insecticidal soap or garlic oil or better yet, spray with diluted Safe Solutions Enzyme Cleaner with Peppermint 2 oz. per gallon of water.

Giant whiteflies can cover a beautiful plant with white fuzzy wax and sticky honeydew, turning the plant into an unsightly mess. First discovered in San Diego County in October 1992, this whitefly has spread northward into other areas of California. Although affected plants may be weakened, they rarely die. To manage giant whitefly, wash off plants with water and encourage natural enemies.

What plants are affected? Many ornamentals including hibiscus, giant bird of paradise, begonia, Xylosma. Fruit trees including citrus, avocado, mulberry and banana. Look for these damage symptoms on affected plants: Long, white, waxy filaments produced by the whitefly give the leaf surface a bearded appearance. These hairlike strands may be mistaken for a fungal infection. Large amounts of sticky honeydew excreted by the whitefly as it feeds on plant sap. Black sooty mold growing on the honeydew.

How to recognize the whitefly: Adults are small (3/16 inch long), white with light brown markings on their wings, and usually found in groups on the undersides of leaves. Nymphs are yellowish, small, oval, have no legs, and don't move.

To reduce infestation problems, use an integrated program that includes: Removing infested leaves. Washing giant whiteflies off leaves with a strong stream of water. Planting species less susceptible to giant whitefly. Avoiding insecticide POISONS that injure natural enemies, such as lacewings, lady beetles, syrphid flies, and parasitic wasps. To confirm the presence of parasitic wasps, use a magnifying glass to look for parasite exit holes on giant whitefly nymphs or darkened nymphs. If you do choose to use an insecticide, select least toxic products such as insecticidal soaps or oils. One of the simplest and most effective controls is a solution of (1 oz. per 2 quarts) Safe Solutions Tweetmint Enzyme Cleaner and water. Remember to follow label directions and spray the undersides of the leaves where whitefly colonies are found.

Whiteflies are tiny, sap-sucking insects that damage leaves of many plants. Adults are white and sometimes have darker markings on their wings. Nymphs, which cause most of the damage, are oval, legless, and don't move. Many species occur in California landscapes, and

natural enemies keep most under good control. Prevent whitefly problems by using reflective mulches, avoiding dust, choosing less susceptible plants, and eliminating pesticides that kill whitefly natural enemies. When management is required, consider using Safe Solutions Tweetmint with Peppermint and sticky traps or removing infested plants.

Signs of a whitefly infestation can include:

Tiny nymphs on the underside of leaves.

Sticky honeydew on leaves, on fruit, or beneath plants, or a covering of black sooty mold.

Yellowing, silvering, or drying leaves that have whitefly nymphs on them.

Deposits of white wax with some whiteflies.

Protect natural enemies such as lacewings, lady beetles, and mini-wasps.

Avoid using pesticides such as pyrethroids, organophosphates, carbaryl, or foliar sprays of imidacloprid.

Prevent dusty conditions.

Keep ants, which protect whiteflies from natural enemies, out of plants.

Recognize signs of parasitization such as circular holes in nymphs (see back) or a change in color.

Install a reflective mulch in your vegetable garden to

protect young plants.

Use aluminum-coated construction paper or reflective plastic mulch products.

Lay the product on bare soil, bury its edges with soil, and insert seedlings or seeds into holes that you make in the mulch.

Plastic mulches require drip irrigation underneath them; paper mulches can be sprinkle or furrow irrigated.

Mulches repel whiteflies and other small flying insects such as aphids while plants are small. Remove mulches when plants get large and temperatures get hot.

Use hand removal and traps to reduce whiteflies.

Prune out isolated infested leaves when you first detect them.

hose off adults or use a hand-held vacuum.

Install ready-to-use, sticky-coated yellow traps or make your own. Use one trap for every medium-size vegetable plant.

Promptly destroy infested annuals when flowering or fruiting ends.

PESTICIDE POISONS.

Even the most toxic insecticide POISONS are only partially effective. If you decide to treat, choose products that are least harmful to natural enemies—such as Safe Solutions Tweetmint Enzyme Cleaners, insecticidal soaps and oils including neem or garlic or cedar oil—and combine their use with the other non-toxic practices listed above. Good coverage, including the underside of leaves, is essential. Repeat applications might be required. Avoid using even these alternatives if many natural enemies are present.

Summary: Adult Whiteflies are minute sucking insects with powdery white wings; whiteflies rest in huge numbers on leaf undersides and fly out in clouds when disturbed. The larvae are flattened, legless, translucent, 1/30-inch scales on leaf undersides. The eggs are gray or yellow cones the size of a pinpoint. Whiteflies are commonly found in greenhouses throughout North America; also found outdoors in warm regions of California, Florida, and Gulf states, and areas on the West Coast. Nymphs and adults suck plant juices from citrus, greenhouse foliage plants, ornamentals, and vegetables. Their feeding weakens plants; they also secrete a sticky, sugary substance called honeydew. Sooty mold, a black fungus, grows on the honeydew-coated leaves and fruit. Whitefly feeding can also spread viral diseases. Females

lay eggs on undersides of leaves; these hatch in 2 days into tiny, mobile scales; while continuing to feed on plant juices, scales molt to a legless stage in a few days. After several growth stages, nymphs rest in a sort of pupal stage before emerging as adults. Most whitefly species require 20 to 30 days for a complete life cycle at room temperature, fewer in summer. Numerous overlapping generations per year, continuing all winter in greenhouses and warm climates. In cold-winter areas, whiteflies may infest plants outdoors during warm summer weather; cold weather will kill them off. Catch adults on yellow sticky traps; vacuum adults from leaves; remove infested leaves; indoors, release Encarsia formosa parasitic wasps to control greenhouse whitefly; outdoors, attract native parasitic wasps and predatory beetles; spray with Safe Solutions Enzyme Cleaner with peppermint (2 oz. per gallon) or garlic oil - make sure you thoroughly spray under the leaves!

WHITE POWDERY MILDEW

White powdery growth on leaves and shoots can be a sign of powdery mildew. This disease affects many plants, and one of several fungi can cause it. Manage powdery mildew by using resistant plant varieties and altering the growing environment. In some situations, fungicide treatments might be required for susceptible plant species. Symptoms can vary by plant species. White, powdery spots develop on both leaf surfaces and expand as the infection grows. Leaves turn yellow or brown and fall off, exposing the plant or fruit to sunburn. Leaves or shoots can twist or distort. The fruiting part of vegetables usually isn’t affected, but apples, grapes, and stone fruits can develop web-like russet scars or corky areas. Powdery mildew is common in warm, dry conditions. Unlike many diseases, powdery mildew doesn’t require moist conditions to grow - actually, moisture during the spring inhibits growth. Moderate temperatures (60º to 80ºF) and shade encourage the disease.

Alter the growing environment to make plants less susceptible. Grow plants in sunny locations. Provide good air circulation by pruning excess foliage. Don’t over fertilize with nitrogen, because lush foliage and shade encourage the disease. Plant resistant varieties. Some highly susceptible plants have resistant or less susceptible varieties. Ornamentals: Crape myrtle, rose, London plane

tree, rhododendron, and zinnia. Fruit: Apple, raspberry, and peach. Vegetables: Melons, pumpkins, squash, cucumbers, beans, and peas. Consider nonchemical approaches. Sprinkle infected plants with water. To prevent other disease problems, do this midmorning, so moisture dries rapidly. Adding soap or Tweetmint Enzyme Cleaner can increase control. Prune out small infestations, and remove infected buds during the dormant season. Quickly remove infected materials, so you don’t spread spores. Some plants may need fungicide POISONS. These plants include susceptible varieties of apples, grapes, roses, and cucurbits. Control mild to moderate infections with horticultural oil or with plant-based oils such as neem oil or jojoba oil. Don’t use oils if you’ve applied sulfur or if it is above 90ºF. Prevent infections with wettable sulfurs, especially ready-to-use products with soap like surfactants. These products aren’t effective after the disease appears. Repeat applications might be necessary. Other fungicides are available. Many must be applied before you see the first fungal growth. The Author believes one of the simplest and most effective controls is a solution of (1 oz. per 2 quarts) Safe Solutions Tweetmint Enzyme Cleaner and water. Powdery mildew can be prevented, and it can be controlled once it appears, but it can't be cured. The key to preventing it is planting mildew-resistant or mildew-tolerant varieties. Resistant varieties get less mildew than

susceptible varieties; tolerant varieties may get some mildew, but it shouldn't affect the performance of the plant. Prevention also includes siting plants where they will have good air circulation, and exposing as much leaf surface as possible to direct sunlight, which inhibits spore germination. To control minor infestations, pick off affected plant parts and either compost them in a hot compost pile or bag them tightly and put them in the trash. Research studies in 1999 and 2003 on infected zucchini and winter wheat (respectively) indicated that spraying cow's milk slowed the spread of the disease so, mix 1 part milk with 9 parts water and spray the stems and tops of leaves with the solution. Reapply after rain. Spraying leaves with baking soda (1 teaspoon in 1 quart water) raises the pH, creating an inhospitable environment for powdery mildew.

YELLOW JACKETS

Yellow jacket wasps prey on other insects and scavenge on human food and garbage. Yellow jackets defend their nests, as do other social wasps and bees, but are more likely to sting if disturbed while they are foraging. Stings generally cause pain and short-term injury, but some people suffer severe allergic responses. Prevent injury by avoiding wasps and removing their food sources. Trapping or nest treatment can reduce populations.

Make sure it’s a yellow jacket.

Yellow jackets are 1/2 to 1 inch long with jagged, bright yellow and dark black stripes. Their narrow “waist” is barely visible. Unlike other common wasps, yellow jackets scavenge on food in dumpsters and garbage cans. They nest in holes in the ground, inside wall cavities, or in hanging nests enclosed in gray paper.

Honeybees are less brightly striped than yellow jackets and are hairier. Usually they aren’t attracted to food (although sometimes to sweets) and are unlikely to sting unless trapped or stepped on. They usually nest inside of cavities in trees or houses.

Paper wasps have long slender waists, build open paper nests under eaves, and are rarely aggressive.

Mud daubers are dark-colored and thread-waisted; build small, hard mud nests; and rarely sting.

Keep your cool to avoid stings.

If a wasp lands on you, don’t swat it or run. Wait for it to leave, or gently brush it away.

Don’t disturb nests. Wasps flying from a hole in the ground or from a building indicate a probable nest.

Remove attractive food sources.

Keep foods, including pet food, covered or indoors.

Cover soda cans outdoors so wasps don’t crawl in.

Keep garbage in sealed cans and empty regularly.

Pick up and dispose of ripe fruit.

Use traps to reduce yellow jackets locally.

Yellow lure traps hung along the perimeter of a property can reduce foraging of some species around patios or picnic areas.

Homemade traps using 2-liter plastic bottles or a meat bait hung on a string just above soapy water may also be used.

Place traps away from areas, such as picnic tables, where people congregate.

To protect yourself and your family, consider calling a professional if you find nests.

If you choose to treat nests yourself, wear protective clothing on your body, hands, and head. Use a sprayer or hose that shoots a long stream of diluted Tweetmint

enzyme cleaner into the nest entrance.

Nests might be far away and impossible to locate.

Paper wasp nests shouldn’t require treatment unless they are near human passageways.

Apple juice traps can be very simple and inexpensive to make. Some simply use a narrow-mouth gallon jar with some apple juice and honey. You can make very inexpensive and highly successful Yellow jacket traps merely by using a plastic bowl, and a piece of fish tied to the stick and placed close to soapy water. Soap causes the surface tension of the water to be greatly reduced, and when wasps or flies hit the water, they crash and drown in seconds. The meat must be suspended about 1/2 to 3/4 inch above the water. Yellow Jackets have an irregular flight pattern as a mechanism of predator avoidance, and this erratic flying does them in when they attempt to approach the meat that is suspended just above soapy water. NOTE: Sometime in September, Yellow Jackets quickly change from meats to sweets as a diet, so be ready to change the bait as needed. Each year, this time of switching baits is a little different, plus or minus a week or so. Soapy water traps can be moderately effective when attempting to reduce the number of Yellow Jackets that are pests at campsites or barbecues. Place four to eight of these soapy water traps around the periphery of the area. During the maximum wasp period

(July through October), this arrangement can greatly reduce the number that may be pestering you. All of the above traps may be used to catch queens in spring or late fall. Trapping queens is an extremely efficient method of reducing Yellow Jacket populations. The very best month for capturing queens is in March. As mentioned before, for every queen trapped and killed, especially in the spring, there will be one to five thousand fewer worker Yellow Jackets during the upcoming season.

Nest destruction is by far the most effective and positive method of Yellow Jacket eradication. This method though is the most labor intensive and dangerous. One can find the underground Yellow Jacket nests by slowly walking through the area, noting concentrated numbers of these wasps. By carefully observing a suspected area, the nest burrow can be located with a little patience. One can also locate the nest by watching the flight pattern of several wasps to the point of origin. First flood the entrance of the nest with a hose-end sprayer and Safe Solutions Enzyme Cleaner with Peppermint, thus killing the guard wasps and the entire colony. You can simply cover the nest entrance with a large glass jar during the evening when the Yellow Jackets are inactive. Next day, the wasps cannot understand the glass barrier of the jar and thus the colony will not dig out and will normally perish.

Crushing Yellow jackets is not advisable. When one crushes any yellow jacket, they release a powerful chemical (pheromone) which will incite other workers nearby to attack you with fearless tenacity.

ALTERNATIVE PEST CONTROLS OR PESTISAFES®

Safe Solutions Tweetmint Enzyme Cleaner with Peppermint - The Author patented this enzyme cleaner that provides a safe and far more effective method for combating virtually all invertebrate (i.e. insects and arachnids) and microbes (i.e. bacterial, algal, fungal, and/or viral) pests which is not only quick-acting, effective but residually non-toxic and which may be used as a replacement for traditional pesticide treatments and as a supplement to the arsenal of currently available integrated pest management techniques. Part of the science behind how Protease enzymes works as a natural pest control agent is that all insects undergo a molting cycle in which they naturally produce a small amount of Protease enzyme to create a chemical "zipper" that splits open a seam in their exoskeletons so they can emerge from their shell and grow larger. Without this vital Protease enzyme, insects would be trapped inside their own exoskeletons and be crushed to death by their own growth. There is no possibility that insects or arachnids can ever develop a resistance to Protease enzymes as a physical control agent because their very existence depends on it!. Indeed, enzymes play many vital roles throughout the insect kingdom. Maggots naturally produce enzymes to help soften up food for digestion.

Spiders and scorpions inject their prey with enzyme and allowing it to predigest the victim. Insectivore plants such as the Venus fly trap also use enzymes to digest insects. Even pests like bacteria and mold naturally use enzymes to break down dead organic material on a cellular level. In The Best Control II IPM encyclopedia - The Author outlines how through his many years of pest control field research, he has continually proven that Enzyme-based compositions are the safest and fastest knock-down "pesticides" available on the pest control market today. Most insects die in about sixteen seconds when exposed to a Protease enzyme and a surfactant blend. Ticks and spiders are arachnids, and have stronger outer shells than arthropods, so they require about two minutes to be destroyed. The dilution rate of the enzyme and surfactant blend can be calibrated to remove only chosen insects such as aphids, but weak enough to protect beneficial insects such as honey bees and lady bug beetles. www.thebestcontrol2.com/. Pest Control has long sought a 'Holy Grail' idyllic pesticide; one that is totally safe for humans, yet certain death to insects, arachnids, molds, bacteria, and viruses that would never become obsolete. This 'Perfect' pesticide would not only be non-toxic but permanently effective too. But, the "industry" continues to only use/misuse various dangerous, synthetic toxins. Sadly, humans do not have the biological tolerance to synthetic pesticides that insects and other pests do. But

conversely, most insects and arachnids do not have any biological tolerance to the Author's safe and far more effective protease enzyme and surfactant biopesticide formulations, such as Lice R Gone®. Click on the following url - www.licergone.com - and watch the lice literally dissolve. WHEN YOU MIX THE CLEANER - IT IS BEST TO FIRST ADD THE WATER AND THEN THE CLEANER - THIS WILL GIVE YOU A STRONGER MIX!

Safe Solutions Food-Grade Diatomaceous Earth is a nontoxic pest control device that works on insects of all species. Unlike pesticides which rely on hazardous poisons to chemically control insects, DE physically controls insects by scouring their exoskeleton through abrasive action. Insects cannot become resistant to physical control, but they do become immune to insecticides. Pesticides not only waste time and money, they also damage human health and environmental ecology. DE must be used with discretion when applying. For example, when DE is used for organic gardening, care should be taken to not apply DE to the flowers of the plant in order to protect the bees that will land there for pollination to occur. Remember, all insects serve a purpose in nature, even those considered pests, and eliminating them causes change. DE has long been implemented by farmers to protect their harvest and livestock from attack by insects. DE is added to grain

storage bins to stop invading pests and also to livestock feed to eliminate internal parasites and other animal ailments. DE is added to baking flours as an anti-caking agent - you have likely eaten bread that was made from flour containing DE. Eating DE can have many health benefits for animals and humans alike, but it is imperative to only consume DE that is from food-grade quality sources. Some forms of DE can be toxic. It is important to recognize that not all forms of diatomaceous earth are non-toxic and safe to use for organic gardening and agriculture. DE that is used for swimming pool filters is toxic to humans and will not control insects. Other brands of DE advertised as "insecticidal" often have additives of chemicals such as pyrethrum and piperonyl butoxide - these products are not safe to eat and should not be administered to animals or humans. Safe Solutions DE is 100% non-toxic, food-grade quality mined from uncontaminated fresh-water deposits. DE, or Fossil Shell Flour, is composed of ground diatoms, microscopic fossils which are mined from deposits of water. Diatoms are the tiny single-celled plants and plankton that live in the sea by the billions, and provide the foundation of the food-chain for all marine life. Even the great whales could not survive without the diatoms. As diatoms die, their exoskeletons drift to the bottom, building up large deposits of diatomaceous earth over time. Geologic changes gradually shift these sea deposits to dry land,

making them available for mining. Because of water currents, many deposits become impure, some even containing arsenic, and can be dangerous. Safe Solutions DE comes from a pure fresh-water deposit that is guaranteed as "Food Grade" quality and is 100% non-toxic - no chemical additives. DE should be sparingly applied using a manual pump duster or mechanical power duster. Spreading the DE as a thin layer of fine powder is more effective than a heavy coating. When using DE outdoors it is necessary to reapply the dust after periods of heavy rain. Avoid inhalation of DE when dusting. Avoid contact with eyes - flush with water. Wear a respirator or dust mask when direct prolonged inhalation is unavoidable. Note: the US EPA has DE on their inert exempted pesticide list but will not allow people to sell the product as an EPA exempt pesticide until you add some active exempted poison to it. The Author prefers to use plain food-grade DE.

Safe Solutions Nontoxic Bug Repellent repels mosquitoes and biting insects. Made from simple natural herbs- rosemary, thyme, and peppermint, quality oils- canola, castor and beeswax. Great for outdoor gatherings, safe for kids events. Mild formula smells pleasant to humans but deters insects. Avoid chemical exposure during physical activity with this potent bug repellent.

Safe Solutions Not Nice To Bugs® is a safe and nontoxic

bug spray that effectively controls any insect or arachnid pest problem without using dangerous pesticide poisons. Eco-friendly, biodegradable, all-natural ingredients kill bugs but are completely safe for humans and pets. Comes in a recyclable spray bottle for easy disposal. Practice safe pest control to protect your home IAQ from chemical exposure.

Safe Solutions Pet Wash Nontoxic Shampoo - Does your pet itch, scratch or bite at their fur? Give them a soothing bath with Pet Wash - a nontoxic shampoo for dogs, cats and animals. Pet Wash quickly eliminates pet problems, removes loose hair and dander which cause allergies, ends odors (including skunk spray!), and restores their coat to lustrous health. Your pet will be grateful for the fast relief, while you can be proud your furry friend is protected from pesticidal bath treatments. Pamper your pet today!

Note: All of the above Safe Solutions products have been registered as "pesticides" with the Michigan Department of Agriculture since at least 2008.

Safe Solutions Flies Be Gone fly trap uses a special bait blended of sterilized food particles that is irresistible to flies but is non-toxic to humans. Based on a simple trick of geometry - flies can crawl their way in through the trap's small opening but cannot fly back out through it. Stop losing money on temporary and costly insecticide

applications. Obtain safer, longer lasting and more effective results in fly control by purchasing Flies Be Gone.

Safe Solutions Nano-UV™ Disinfection Scanner - This compact and lightweight disinfection device uses ultra-violet light to safely kill surface germs of infectious diseases and the eggs of lice, fleas, dust mites (bed bugs). Surfaces become 99.99% germ and virus free after just a quick 10 second sweep! Kills epidemic bacteria such as E-Coli, SARS, Staphylococcus Aureus, Salmonella and Avian Bird Flu.

Just a few other alternatives to synthetic pesticide poisons: A FEW OF MY FAVORITE OFFENSIVE WEAPONS OR PEST CONTROL "TOOLS" OR PESTISAFES®!

If I asked you to roll around and/or climb on concertina (razor) barb wire - you would think the request absurd - yet ants can climb all over it without harm - you can powder your baby's bottom with talcum powder, but ants will quickly leave an area where talcum is sprinkled. Volatile, synthetic pesticide poisons were basically invented to kill man - why try using them on insects? Unlike the "professional" pest control industry that only has one "tool" to control pest problems -volatile, synthetic pesticide poisons - we want you to begin to understand my "tool box". The following are only a few

of my favorite things or "tools" or Pestisafes® to control or repel the species of pesticide resistant insects that annoy man and/of that damage his crops and/or the other nuisance wildlife that "bug" him. The poison "industry" and "some" regulating people want to "register" these Pestisafes® as "pesticides" because they kill, repel and/or control pests better than "their" registered economic pesticide poisons do - to them I ask the simple question, "If I crush a resistant ant with an ice cube and then the ice cube melts, is the moisture and/or vapor still an unregistered `pesticide'?" It is my understanding that all materials generally recognized as safe (GRAS) and/or naturally occurring things do not need to be legally registered unless you want to claim or make them all proprietary products.

We know that if we try to kill a pest with "their" volatile, synthetic pesticide poisons - "their" poisons and inerts often can and do remain behind to contaminate and harm us, our children, pets, food, water, homes and environment for a long time - the toxic pesticide poisons that remain to contaminate and create pesticide resistance are not simply moisture or vapor, but dangerous poisons! It seems simply amazing and implausible to me that my techniques and Pestisafes® that are safer, less expensive, more effective, scientifically provable, field tested and result oriented would meet such resistance - especially from "open-minded scientists." But, to them, the Author

would say you can not serve the public and your own selfish, archaic interests. You either love your fellow man or you love money and power more.

Hang Mylar balloon or strips of tin foil and allow them to move in the breeze to repel birds and bats and other creatures.

Hot Pepper Spray - Hot peppers have a compound in them called capsaicin. Mammals are sensitive to capsaicin, and the compound registers on their taste buds as "hot" and serves as an irritant. This spray is considered to be effective for such garden animal pests as deer, rabbits, voles, squirrels, possums and insects. Take one quart of water and put it in a pot. Take one-half cup of dried hot peppers (available at most Asian groceries), and put them in the pot. Bring the pot of water and peppers to just barely boiling. Then turn off the heat and let it cool to room temperature. Strain out the peppers and throw them away. Put the liquid into a spray bottle. Label it with a permanent marker so that anyone coming across it knows what the contents are; it's also a good idea to add the date to it. For added sticking power, you might like to add a few drops of pure dish soap to the liquid as well. Spray it on the plants you want to protect. Always wear gloves and eye protection before using this spray—it can burn your skin and eyes if it touches them and it's painful. Be sure to spray the entire plant, for full protection.

Shake before using. Use the spray early morning or in the evening—if sprayed in the heat of the day, it may burn the plants. If you're not sure how sensitive plants will cope, test a small area first. Wait four days and if the plant doesn't react, then using the spray on it should be okay. Do not spray this on windy days. The back spray may hit you or go anywhere but on the plants you're trying to protect. Re-spray every week for maximum benefit. It will also need to be reapplied after rain. This spray should also be a help in deterring dogs and cats that are relieving themselves near favorite plants. Finely ground ghost pepper will make even a grown man run if he gets some in his nose or eyes! The hottest pepper the Author has ever used is Ghost Pepper!

Neem - One of the best natural or botanical pesticides for controlling bloodfeeding arthropods and other pests is Neem. What is Neem? Neem, a member of the Meliaceae family and a botanical cousin of mahogany, is a tall, fast-growing, evergreen tree which has an attractive crown of deep-green leaves and masses of honey-scented flowers and thrives even in nutrient-poor, dry soil. It tolerates high temperatures, low rainfall, long spells of drought and salinity, and can be propagated by seed. Because of its many benefits, neem has been worshipped as a goddess in India. Neem is bitter in taste. The bitterness is due to the presence of an array of complex compounds called "triterpenes" or more specifically "liminoids". The

most important bioactive principle is a terpenoid known as azadirachtin; however, at least 10 other neem limonoids also possess insect growth regulating activity. The tree's scientific name is Azadiractita indica. Neem has been used for centuries primarily against household and storage pests, and to a limited extent against crop pests. Neem trees were the only green thing left standing during a ravaging locust plague in Sudan in 1959. Neem does not kill pests but affects their behavior and physiology and reduces the risk of exposing the pests' natural enemies to poisoned food sources or starvation. Neem derivatives affect more than 200 insect species belonging to Coleoptera, Diptera, Heteroptera, Homoptera, Hymenoptera, Lepidoptera, Orthoptera, Thysanoptera, several species of mites and nematodes, and even noxious snails and fungi. Although neem oil can be used directly for pest control, semi-purified "bitters" and "neem rich" fractions can easily be standardized for biological properties and could satisfy even stringent quality requirements. Being water soluble, they also can be applied as systemic compounds which render them more photostable and nonphytotoxic. A garlic odor often present in other neem products is absent in "bitters". Neem products are effective and relatively hazard-free. An added benefit of using semi-purified neem fractions, rather than pure compounds, is that pests will be less likely to develop resistance. Neem compounds act

together on several different behavioral and physiological processes which also helps prevent insects from evolving resistance to the compound. Their effects include repellence, feeding deterrence, reduced ingestion and digestion of food, poor growth and development, reduced longevity and fecundity, mating disruption, oviposition deterrence, inhibition of egg hatchability, molting failures and direct toxicity. Reports suggest that by paralyzing the muscles in the insects' mandibles neem induces starvation. At lower than lethal dozes, azadirachtin also mimics juvenile hormone, preventing insects from maturing. Neem-based insecticides can be further fortified against dynamic pests by optimizing their use with microbials or other botanicals. Neem fruits, seeds, oil, leaves, bark and roots can be used as general antiseptics, antimicrobials for the treatment of urinary disorders, diarrhea, fever, bronchitis, skin diseases, septic sores, infected burns, hypertension and inflammatory diseases. Neem oil and its isolates - nimbidin, nimbidol and nimbin - inhibit fungal growth on humans and animals. Neem leaf extracts and teas are used to treat malaria; ioquin tablets and injections containing neem extract are currently being formulated for treating chronic malaria. Exposing kissing bugs (Rhodnius prolixus), the major vector of Chagas disease in Latin America, to neem extracts or to azadirachtin "immunizes" them against their internal protozoan parasite Trypanosoma

cruzi. We are trying it on termites. Cattle leaf supplements containing neem leaf powder are used as worm killers. Creams containing neem oil are used for animal wound dressing and also act as fly and mosquito repellents. Neem oil in human bathing and laundry soap kills lice and neem in dog soaps and shampoos controls ticks and fleas. Neem twigs are used daily by millions in Bangladesh, India and Pakistan as disposable toothbrushes; extracts of neem bark are used in some toothpastes and mouthwashes. Neem plantings also serve as a refuge for honeybees, wasps, spiders, birds, bats and other beneficial organisms, and the litter of falling leaves can improve soil fertility. Neem overall is a relatively safe, natural (botanical) pesticide poison with numerous benefits. Neem nectar does not kill pollinating bees.

Noxema® - We have found that Noxema® or Ben-Gay® applied to the exposed skin of children and people repels mosquitoes and other pests. (Always check to see if you are sensitive before using any product.)

Invincible Herbal Insect Repellent from Great Garden Formulas by Joan Benjamin and Deborah L. Martin: "...before heading outdoors, I douse myself with an incredible repellent that my friend Marion Spear and I concocted, Tina Wilcox, head gardener at the Ozark Folk Center in Mountain View, Arkansas says. "It renders me almost invincible to both insects and poison ivy!"

Ingredients and Supplies:

1 large handful fresh jewelweed (Impatiens capensis)

1 large glass jar with plastic lid (vinegar corrodes metal)

1 strainer

1 quart apple cider vinegar

½ teaspoon pennyroyal oil

1 teaspoon eucalyptus oil

1 teaspoon orange oil

1 teaspoon citronella oil

1 plastic spray bottle

DIRECTIONS:

Crush jewelweed in the jar and cover with vinegar.

Let steep for several days.

Strain out the jewelweed and mix essential oils into the vinegar.

Before applying all over, spray a small amount on the inside of your arm and monitor for 15 minutes for any allergic reaction.

To use, spray thoroughly on clothing and lightly on any exposed skin except your face. Reapply every ½ hour or so. (To keep insects away from your face, spray your hat or bandanna.)

Yield: About 1 quart of invincible spray. Note: This formula will keep indefinitely. Caution: If you are pregnant, don't use pennyroyal, even topically, as it may increase the risk of miscarriage. Note: Citronella oil has been known to attract female black bears.

Common Sense and Knowledge - Never throw rocks at a hornet nest or approach bees during a thunderstorm. The electricity in the air makes them more aggressive. There are over 700 species of venomous arthropods with those in the order Hymenoptera (ants, wasps, hornets and bees) accounting for the greatest percentage of deaths, usually from an allergic reaction. Usually the only result is an unpleasant experience; even so, BEE CAREFUL! If you

feel an insect crawling on you, it should be brushed away and not crushed, slapped or pinched. Remember to use mosquito netting, talcum powder, double-sided tape, duct tape (sticky side up), glueboards, Vaseline (petroleum jelly), screens, caulk and vacuums; the best control is to avoid and/or exclude them. NOTE: Not Nice to Lice® and Pet Wash shampoos and/or Safe Solutions, Inc. protease enzyme cleaners remove itching and irritations caused by poison ivy and/or insect bites and stings.

Conditions Conducive to Infestation – Remove what your pest needs to prosper and/or even to survive and you will always win the war!

PREVENTION - This is the Very Best Control or Defense. It is the beginning of Intelligent Pest Management®.

To an insect or rodent, your home or building and its surroundings is a macro-environment consisting of thousands of micro-environments; many with their own "climate", moisture, temperature, food and/or conditions conducive to their invasion or infestation. All creatures have the same four requirements we have for survival: food, water, shelter, and warmth. Most structure invading pests are controlled when you simply control water (moisture for drinking and the relative humidity) because water is their most critical survival factor. So properly ventilate, install and maintain dehumidifiers, fans and/or

air conditioners and quickly correct/repair all moisture problems.

Inspection: The second best control you can use is to conduct a proper and thorough inspection - 90% of your pest problem will be in 10% of your building or lawn. If you don't see anything during the day, conduct a nighttime search and destroy mission using a red (or black) light. You must look everywhere.

Imagination and Common Sense: The third best control is your mind; it is 200,000 times bigger than most of your pests, so think before you act - many controls can be as simple as vacuuming up the pest, closing a window or vent, caulking, stepping on the "bug" or tuning on a fan or dehumidifier. Common sense is not too common.

Decrease moisture: Properly install and maintain vents, vapor barriers, fans, air conditioners, and/or dehumidifiers. Moisture is the major destructive factor to homes and the major key to pest control elimination. Control moisture and you control pests and damage to your building.

KEEPING THEM OUT

Exclusion: Seal cracks: The first defense is making sure pests don't get into your home. Crawling pests enter through cracks in or around the foundation or siding or doors and windows, while flying insects usually come in through open doors and windows. An annual inspection of the foundation and siding to caulk cracks (use good quality sealant) is a good idea. Be particularly careful to seal around exterior plumbing and electrical outlets. Make sure that door thresholds have good weather stripping under them and that the door and windows seal well when shut. Check that screens on windows, crawl space vents, and attic vents are intact and sealed around the edges. Remember 80% - 90% of all insect infestations migrate from the outside into your structure. Only 5 types of pests are generally carried inside buildings to create pest infestations; they are German cockroaches, fleas, stored product pests, mice and Pharaoh ants, so inspect for them. Don't forget to install door sweeps.

Use of screens: Window screens are excellent for keeping insects out of a house, but screen doors are not very effective. This is because flies and mosquitoes are attracted to people or food odors so they hang around outside screen doors and whisk inside every time the door is opened. Try to ventilate the house adequately without screen doors, at least on heavily used entrances. If screen

doors are used, they should have strong spring closures that shut the door quickly and tightly.

Use of glueboards, duct tape and repellents: Prevent many pest invasions by properly using glueboards or duct tape and by sprinkling dry Tide laundry soap powder or talcum powder or medicated body powder or Comet® or food-grade DE as a barrier inside and outside.

Manage lights: Good design and management of exterior lighting is important to prevent insect problems. Avoid leaving porch lights on all evening to collect a cloud of moths and other insects and/or predators, e.g., bats. Every time the door is opened, the insects swirling around the light are swept into the house. Minimize the attraction time by turning porch lights on only when they are needed. Sensor lights that switch on in response to motion are ideal because they light the area for arriving guests, but switch off after a few minutes (saves energy too).

When designing the lighting around the exterior of a new home, don't put light fixtures directly above the doors, especially over doors to decks or patios that might be used a lot in the evening. Place flood or spot lights a few feet away from the door and direct the light onto porches and stairs. This illuminates them safely, while keeping the mesmerized insects away from your door. Use yellow bulbs in yard light fixtures; flies and moths are not as

attracted to yellow as they are to ordinary white light bulbs, or try sodium vapor lighting.

Manage the garbage: Keep garbage in sturdy, tightly covered containers and wash them out regularly with Safe Solutions, Inc. Enzyme Cleaner with Peppermint and borax. This prevents flies from breeding and reduces the attraction for ants, yellow jackets and other insects. If the kitchen food garbage can be composted daily, the trash will contain little that is attractive to insects. Where composting is not possible, tightly wrap up kitchen garbage, take it out frequently to a covered trash can, and dispose of it in sealed plastic bags. Avoid letting old clothes, newspapers, paper bags, cardboard, empty cans, and other trash accumulate in storage rooms, garages, etc., as these provide breeding sites for many household pests.

Manage your soil: Healthy, organic soil prevents many pest and weed problems.

Always remember: No one control will ever work in every situation. Try the simplest and safest control first and then, if that doesn't work, try some of the other control suggestions or a combination of the safer control suggestions. If you still don't get control, read the appropriate chapter in The Best Control© or The Best Control II©.

ACTIVATED CHARCOAL FILTERS AND FANS -

remove dust mites, mold and mildew spores, odors, pesticide POISONS, allergens, pollen, etc. from the ambient air.

AIR - A blast of air from an aerosol can, bicycle pump, or straw or air compressor can be used to flush roaches from their hiding spots instead of using a can of aerosol poison; then you can vacuum them up. Fans left on 24 hours, 7 days a week will control roach and bat infestations and desiccate many insects and will repel many flying insects, e.g., flies. Hot air can be used to quickly control spot roach infestations and help dry out fungal infestations. Air circulation should also be encouraged in garden plantings to help control many diseases. Air containing less than 2.5% oxygen protects stored commodities by stopping insect and fungus activity.

ALKA SELTZER® - pieces of Alka Seltzer® thrown into the air and swallowed by sea gulls will quickly kill them. Lightly cover it in peanut butter or grease to kill rats and mice. Put an Alka Seltzer or two in a bowl of soapy water to catch insects, e.g., fleas and mosquitoes. Use them on damp sponges to attract bed and kissing bugs.

ALUMINUM FOIL - Protect young trees form mice and rabbits - wrap the trunks loosely to a height of 18” with glittering, rattling aluminum foil. Place a 30”-wide strip

shiny-side up on the ground to repel aphids and thrips and reflect light upward to speed food/flower production by two weeks and to help retain ground moisture. Hang aluminum foil from plants, trees or your home to keep birds away. You can also use it to increase winter light for house plants. Aluminum foil collars can also be used to protect plant seedlings from cutworms. Aluminum foil repels some cats. Aluminum foil lightly wrapped 2” below the soil and 2” above the soil surface will deter southern blight on tomato and pepper plants.

ANTS - In 324 B.C.E. the Chinese introduced ants (Acephali armaragina) to their citrus groves to control caterpillars and large boring beetles. If you follow ants up the tree, you will find the aphids, scale and/or disease.

ASPARTAME - contains about 40% neurotoxic aspartic acid. Aspartame is a very powerful ant and mouse killer.

Carpenter ants and mice will eat the powdered aspartame, but small black ants are best controlled when you mix the aspartame in apple juice and/or honey. To control fire ants, sprinkle aspartame on the mound; then slightly moisten the powder with water. Try it in juice to control yellow jackets. When handling any toxin protect your skin and keep it out of your mouth. Aspartame is 10% methanol; when ingested or at any temperature over 86o F. it converts to formaldehyde and then formic acid - the same substance used to strip epoxy urethane coatings.

(Formic acid causes metabolic acidosis.) Formic acid is the poison found in the sting of fire ants. The methanol toxicity mimics health problems, e.g., multiple sclerosis and systemic lupus. The other 90% of aspartame is comprised of phenylalanine and aspartic acid, amino acids which, when separated from the other amino acids in you body, can become neurotoxic. In the 1970s FDA refused to approve aspartame for human consumption due to studies linking it to brain tumors, neurological disorders and even death in laboratory animals. Strings were pulled by powerful men like Donald Rumsfeld and aspartame was approved by the FDA without further ado. If you are using aspartame (NutraSweet, Equal, Spoonful, etc.) and you suffer from fibromyalgia symptoms, spasms, shooting pains, numbness in your legs, cramps, vertigo, dizziness, headaches, tinnitus, joint pain, unexplainable depression, anxiety attacks, slurred speech, blurred vision or memory loss…you may have aspartame poisoning. Aspartame triggers gross obesity, suicide, diabetes, behavioral problems and learning disorders and many other diseases and symptoms. www.sweetpoison.com/aspartame-side-effects.html

ASSUME - When you assume you make an ass out of u and me.

BAITS - Why use baits?

Make the pests help do their own pest control by taking

the toxin where it will kill the others

No or low odor

Little or no volatility

Low % active ingredient

Low volume application

High % mortality

Good service life

Safety - less risk - Caution: Any time you make a toxic bait (even with borax or food-grade DE) add green food color to the bait and note on it clearly - "Not for human consumption."

BAITING FOR GERMAN COCKROACHES:

Perform a thorough inspection. You will need a "red or yellow" flashlight at night.

Put bait as close as you can to the cockroaches. Make it easy for them! Bait detection zone is about

12"; apply small amounts of bait in many places.

Use enough bait to feed the entire cockroach population. For example: A baiting program wasn't "working", and the PCO still saw cockroaches. But when he checked, the PCO found the bait was all gone. He didn't use enough bait to feed/kill off all the population.

Do a follow-up evaluation on any bait's performance - 10 - 14 days.

Caution: If you kill cockroaches and they die inside your building, you will breathe them in a few months.

Termite baits are just starting to be introduced and be used. The best termite bait station is the made of rolled cardboard and described in The Best Control II at www.thebestcontrol2.com. A termite bait station to be effective must be properly placed near the structure, but away from soils contaminated with termiticide poisons. Virtually any diluted antibiotic or salt spray will quickly kill a feeding colony of termites. As EPA and environmental concerns limit traditional termiticides, people will rely more on baits. Trying to get a feel for the

colony is important for treatments, esp. baits. Worker termites and supplemental queens are the ones to key on with your bait treatments. Placement is important. Use ½% - 1% disodium octoborate tetrahydrate or table salt or borax as the maximum amount of toxin in your (cardboard or cellulose insulation) baits, or use Flagyl® or goldenseal which also helps to kill the protozoa and bacteria in their guts.

BARRIERS

Anything that will keep pests off and out of an area, e.g., door sweeps, fences, caulk, garlic, duct tape, double-sided tape, Vaseline, screens, doors, air curtains, chalk, ditches, moats, sound, lights, shields, covers, fragrances, chemicals, DE, repellents, temperature, microwaves, edging, essential oils, pepper, talcum powder, cinnamon, steel wool, sand, lime, copper, ashes, plants, cloves, corn gluten meal, glass, visquine, tapes, etc.

BENEFICIALS

Beneficial insects are classified into two major groups: 1) Predators that attack, kill, and eat their prey and 2) Parasites which lay eggs in or on a host which later hatch and kill the host. Pathogens are a third group of beneficial organisms e.g., bacteria, viruses, and/or fungi which invade the host and cause disease. Insects, nematodes, BT, milky spore, decollate snails, microbial fungicides, streptomycin bacteria, lacewings, predatory mites, lady bugs, praying mantis, earwigs, yellow jackets, and/or predator wasps, mealy bug destroyers, etc. The costs are varied and the types of beneficials extremely varied, e.g., the lacewing is not mobile at the time of application and must be applied directly to the infested area, while adult lady bugs can be released to find their own target pests, but lady bugs are captured and not raised and may be out of stock. There are many suppliers and, as with most trends, you can expect more to come on line. Many of the companies who supply beneficials also employ consultants. These consultants typically have a wealth of knowledge regarding specific traits and tendencies that each beneficial is capable of demonstrating. Biological control of pests involves the use of one living organism to control another. For example, most arthropod pests have natural enemies or disease organisms that control or suppress them effectively under some conditions or in some situations. Occasionally insects or microorganisms

contribute to the control of certain weeds. Many microorganisms also provide natural control of pest birds and rodents. Sometimes biological control can be an important component of a pest management program by taking advantage of these helpful organisms. When natural enemies or microorganisms are present, efforts can be made to protect them so they may increase in number and help control pests more effectively.

One of the first references to natural pest control comes from J. C. London (1850) in his “Encyclopedia of Gardening (Book III, pg. 819) when he suggested a toad kept in a mushroom house will eat worms, ants and other insects, but to most people the idea would be disgusting of a toad crawling over anything intended for the table.”

BORAX, OR SODIUM TETRABORATE - is a combination of sodium, boron and oxygen, and is mined from the soil in its crude form. Boric acid is a crystalline material derived from borax. Caution: Remember, boric acid and all boron products can act as a stomach poison when ingested. While 20 Mule Team Borax® is extremely effective in controlling or eliminating ants, termites, weeds, lice, fleas, spiders and roaches, the Dial Corporation notes, "This product has not been tested nor received approval from the EPA for use as a pesticide." Even so if you mop or spray the floors, voids, sill boxes, tunnels, backs of furniture, appliances and other areas

where you see insect pests with borax - you will be surprised on how great the material controls virtually all pests. It has been used for years to make cellulose insulation insect free and fire retardant. It also is great for removing stains in carpeting and/or odors in urinals, etc. - so mop to remove odors and to help clean - in doing so you will also control pests "accidentally". In their 1920 - 1928 Burroughs Welcome & Co. (USA) Inc. catalogue they note borax (Sodii boras) is an antiseptic, used for lotions, mouthwashes, and gargles. Also given internally for epilepsy. Note: Chroma Trim Gum® includes 200 mcg of boron (as sodium borate) as a "food supplement". The use of borax to disinfect: Mix ½ cup of borax in 1 gallon of hot water to disinfect all surfaces. This mix will also inhibit mold growth. Borax and boron products should not be eaten or ingested! Be careful not to contaminate food, utensils, pets or people.

Borax Summary - (sodium borate) cleans, deodorizes, disinfects, softens water, cleans wallpaper, painted walls, baby diapers and floors. The Author uses borax to treat wood so it will permanently control termites, rot, fungus, mold and other wood-destroying pests and make the wood fire retardant. Boric acid ophthalmic (for the eyes) is used as an eye wash to cleanse or irrigate the eyes. Boric acid provides soothing relief from eye irritation, and helps remove pollutants from the eye such as smog, chlorine, or other chemicals.. Borax is the common name

for sodium borate, a natural, alkaline mineral found in the Western US and China; unbelievably, it has been in use for over 4000 years. You can find Borax in the laundry isle of your local grocery store. It has no toxic fumes, is not flammable, is safe for the environment, and can be mixed with most other cleaners. It cleans, deodorizes, disinfects, kills mold and mildew, softens water and repels bugs such as cockroaches, fleas and others. It's cleaning and bleaching power comes from its ability to convert water molecules into hydrogen peroxide, and its high pH (9.5) increases the effectiveness of bleach and other cleaners. The boron and salt inhibit the metabolic processes of many organisms, disinfecting and killing many pests. It is a mild skin irritant and should never be ingested, or used around food.

BORIC ACID - Boric acid and its salts have been used for pest control for over a hundred years, and in folk remedies for more than 1000 years. Boric acid baits have been used since the late 1800's. Boric acid has been used in medicine since the time of Lister in the 1860's. It was first used to protect wood in the U. S. in the 1920's against blue stain fungi. The fire retardant properties of boric acid were discovered in the 1930's. Celcure® was patented in 1933 to prevent wood fungi decay. These substances are various forms of boron which also routinely is found normally circulating at low levels in our blood streams. Boric acid and other insecticidal dusts

are inorganic pesticides that have other uses besides their insect killing power. For example, boric acid is a wonderful pesticide as a 99.95% pure dust formulation, but in a 1% water solution, it is commonly used as an eyewash. Most dust formulations have an abrasive action on the insect which removes the waxy coating on the exterior of the insect's body. The waxy coating is used to retain water and without it the insect quickly dies from dehydration. Be careful not to contaminate food, utensils, pets or people with any (boron) product! 5. BUG JUICE COCKTAIL - Blend ½ cup aphids or 1 cup infested leaves and 2 cups water strain and spray. If you see a handful or two of your garden's cabbage loopers are chalky white and weak - they are infected with nuclear polyhedrosis virus (NPV) - put loopers in blender with water, strain and spray over crops. The remaining pests will die in several days - try a mixture of bugs, strain, and spray. Collect ½ cup of any specific pest and mash well. Mix with 2 cups water, and strain. Mix ¼ cup of this bug juice and a few drops of soap with 2 cups of water, and spray. Don't make yourself sick, too! Use nonfood utensils, a mask and wear plastic gloves.

CAFFEINE - can relieve headaches and asthma symptoms and is a diuretic and is useful in treating attention deficit disorder and hyperactivity and helps burn fat. Caffeine is one of the chemicals called xanthines which stimulate the central nervous system creating

feelings of restlessness and nervousness. Caffeine is excreted in urine as methylxanthine and methyluric acid as a product of metabolizing caffeine. Caffeine has several effects on the cardiovascular system. With diuretics you actually lose more fluids than you gain. Caffeine can, therefore, be useful in pest control by helping to desiccate/dehydrate and/or over-stimulate the pests. Caffeine will kill snails and slugs and tadpoles and frogs. Water-soluble caffeine penetrates the mucous membrane.

CALCIUM CARBONATE - Finely ground limestone or calcium carbonate controls/kills insects because it has wonderful desiccant properties; it produces a different kind of insect mortality when it is formulated as a pottery glaze. It occurs naturally in shells, bones, etc. and is chiefly used as an antacid in its natural form for people and animals; also called precipitated chalk. You can finely grind materials in a coffee or pepper grinder even in the field.

CARBON DIOXIDE CO2 OR DRY ICE - can be used to freeze pests, e.g., an entire hornet or wasp nest, which can then be safely removed and placed inside double plastic bags, frozen for several days or buried. You can also freeze other insects, e.g., roaches. Carbon dioxide fumigation has been widely used to treat stored grain. Grain bins and other structures have also been routinely

treated with carbon dioxide to eradicate insect infestations.

We believe the insect opens up its breathing apparati when exposed to high levels of CO2 and then suffocates from the lack of oxygen. Carbon dioxide will also suffocate rats and other mammals in their tunnels. Concerns have been raised regarding the production of carbonic acid from the CO2 and the water in the chamber and its subsequent danger. Carbon Dioxide (CO2) - will attract ticks, houseflies, mosquitoes, termites, etc. and can also be used as a fumigant in the ground and in traps where it literally “takes their breath away” in seconds. The ants or animals quickly go to sleep and then painlessly die of asphyxiation. It can also be used to safely fumigate pests in stored food/ commodities and/or to kill bagged and sealed creatures, e.g., roaches in food carts, in an environmentally safe fashion without the use of any poison. When CO2 is placed in traps, tunnels/runways, mounds, etc., it will quickly kill all living creatures in those underground areas because it is one and a half times heavier than air. As the CO2 moves downward throughout the tunnels, mounds, runways, etc. it also pours into all connecting mounds or tunnels or nests very effectively, very quickly and very safely.

Without giving any warning or odor, it replaces the air, killing the occupants, whether insect or animal, and then

slowly dissipates back into the atmosphere to be used by the plants. CO2 can be used virtually anywhere and is non-toxic to lawns and plants and its pest control results are immediate.

The Author believes it is possible to fumigate homes with CO2 by tenting them and “pouring” carbon dioxide in from the top, allowing the regular air to exit from a “chimney”; test the escaping air and once you find enough CO2, stop “pouring”. This should be used in combination with sodium borate for residual control. Carbon dioxide could/should replace volatile fumigant poisons in homes and buildings, ground, grain and stored product applications. It can be purchased as dry ice, in pressurized containers or in fire extinguishers. When you use a CO2 container, 12’ of hose and pipe you can put a large Tupperware bowl over the nest upside down and inject CO2 through a 1” hole you can drill on the top or simply inject the gas into the tunnels and/or holes. 6% carbon dioxide can destroy your kidneys! The air normally contains.03% carbon dioxide. Carbon Dioxide Caution: wasg.iinet.net.au/Co2paper.html

CARBON DIOXIDE FIRE EXTINQUISHERS - can be used to freeze pests, e.g., an entire hornet or wasp nest, which can then be safely removed and placed inside double plastic bags, frozen for several days or buried. You can also freeze other insects, e.g., roaches. Carbon

dioxide fumigation has been widely used to treat stored grain. Grain bins and other structures have also been routinely treated with carbon dioxide to eradicate insect infestations. We believe the insect opens up its breathing apparati when exposed to high levels of CO2 and then suffocates from the lack of oxygen. Concerns have been raised regarding the production of carbonic acid from the CO2 and the water in the chamber and its subsequent danger.

CARBON DIOXIDE ATTRACTANTS - CO2 can also be used to trap and/or attract termites, mosquitoes and ticks and

fleas. Use dry ice or carbon dioxide cylinders to fumigate burrows and carpet pests, ant/wasp nests, etc.

CASTOR BEAN PLANTS, Ricinus commanis - native to tropical Africa, effectively reduce soil nematode populations, but the seeds and the entire plant are toxic.

CASTOR OIL - will repel chipmunks, gophers, squirrels, rodents, moles, armadillos, pocket gophers and other burrowing/tunneling animals when sprayed in their tunnels and/or on lawns in spring, summer and fall at a rate of 1 quart 100% castor oil USP per 5,000 square feet mixed in water. The castor oil covers their food and disrupts the animal’s digestive system. Chiggers drown in castor oil. Degummed castor oil is a penetrating solvent that immediately penetrates rusted and gummed-up parts,

insects and arachnids. If you have chigger bites, shower and rub pure castor oil on your infected skin. You can also rub the bites with a moist aspirin tablet.

Castor Oil/Mineral Oil Mix - Castor beans have been used medically at least since the first century A.D. Mix 3 parts castor oil with 1 part mineral oil. Fill and eye dropper and put 1 - 2 drops of this mix on the top of an ear of corn (when the silk is just about to come out) to prevent egg-laying/hatching of corn earworms. When the corn starts to make silk, put 2- 3 drops inside the silk on each ear of corn. Do this at least 3 - 4 times per season.

CAT LITTER - Well used cat litter will repel woodchucks and moles. Fresh cat litter sprinkled at the bottom of garbage containers will keep them smelling fresh - change weekly or when damp. Take well used (dark) cat litter and put in water, strain and spray the stinky solution to repel Canadian geese and other herbivores.

CATNIP- is a perennial herb (Nepeta cataria) that grows 2’ tall and it can be used to repel/control many insect problems. Catnip oil contains at least 23 compounds, but commercially-available cat nip oil can be 80% - 90% nepetalactone. Catnip oil is probably a CNS depressant. Catnip is an antifeedant for many vertebrates, including deer, rabbits and squirrels. Catnip’s active ingredient, nepetalactone, is an aphid pheromone that can be used to

trap aphids. Catnip interplanted with collards reduced the flea beetle infestations. Brew some as a tea: Fill a jar with leaves and then add water and leave it out in the sun for 3 - 4 hours. Repels roaches, ants, mosquitoes and many pests, including the Colorado potato beetle, but it still will attract cats. Nepetalactone, the active ingredient, found in catnip oil repels roaches 100 times better than poisons. Catnip oil will repel/kill termites until it breaks down. Catnip makes a soothing tea for stress or sleeplessness. Use the flowering tops for colds and/ or bronchitis. There are more than 250 species of catmint genus Nepeta. Not all contain nepetalactone; some that do are Nepeta cataris, N. mussinii, N. nepetella and N. citridora

CAULK - Seal all visible cracks, crevices, voids, and other openings (that you can insert a business card into) to prevent and/or control many pest problems.

CAYENNE - If you cut your finger with a paring knife, try sprinkling powdered cayenne pepper on the wound. It will help your blood to clot and it won’t burn, as you might imagine. Cayenne contains a pain-relieving chemical called capsaicin, which appears to work by interfering with the action of Substance P, a chemical in the peripheral nerves that sends pain messages to the brain. Powdered cayenne repels most mammals and a liquid formulation can be used as an alternative

insecticide to destroy mosquito larvae; as an alternative mollascicide to control zebra mussels and as an alternative fungicide to control mildew. Cayenne peppers also contain a particular saponin that breaches fungal cell membranes, creating little tears or holes that destroy fungal pathogens that adversely affect strawberries, blueberries and other small fruits. The chili pepper has been used to treat stomach aches, cramping and gas. It helps burn fat and reduce appetite and will often normalize blood pressure and oxygenate blood.

CHARCOAL - Activated charcoal filters can remove dust mite and cockroach allergens and/or odors and clean chemicals out of the air when you put one on both sides of a running box window fan.

CHARCOAL BRIQUETTES - Lit briquettes create carbon monoxide and when placed in tunnels - carbon monoxide is heavier than air - and all living things die that breathe this gas. Be careful if you try this control and first check regarding any ordinances that would prohibit it's use.

CITRUS - The scent of citrus is very aromatic. In addition, it contains certain chemicals that can repel pests. You can boil orange peels in water to create a solution against fleas. You can also use this solution on your carpets, furniture, and other upholstery. Another tip is to use lemon juice and spray it on the most likely

entryways of ants and roaches. Spiders taste through their feet and don’t like the taste of citrus or peppermint. So using citrus oils as well as peppermint can detract them from coming into an area. I’ve heard that lemon & peppermint essential oils are the best oils to use because they have a very strong smell and peppermint can actually feel hot as well.

CLEANERS – Virtually any cleaner will kill insects faster and safer than any insecticide POISON!

COMMON SENSE - The greatest tool and one of the rarest.

CROP ROTATION - Crop rotation is one of the oldest and most effective cultural control strategies. It means the planned order of specific crops planted on the same field. It also means that the succeeding crop belongs to a different family than the previous one. The planned rotation may vary from 2 or 3 year or longer period. Some insect pests and disease-causing organisms are hosts' specific. For example, rice stem borer feeds mostly on rice. If you don't rotate rice with other crops belonging to a different family, the problem continues as food is always available to the pest. However, if you plant legume as the next crop, then corn, then beans, then bulbs, the insect pest will likely die due to absence of food. Advantages of crop rotation - Prevents soil depletion, Maintains soil fertility, Reduces soil erosion,

Controls insect/mite pests. Crop rotation as a means to control to insect pests is most effective when the pests are present before the crop is planted have no wide range of host crops; attack only annual/biennial crops; and do not have the ability to fly from one field to another. Reduces reliance on synthetic chemicals, Reduces the pests' build-up, Prevents diseases and helps control weeds. You can simplify your rotations by sorting your crops into these major plant families: Onion family: onions, garlic, leeks and shallots. Carrot family: carrots, celery, parsley and parsnips. Sunflower family: lettuce, sunflowers and a few other leafy greens. Cabbage family: cabbage, broccoli, Brussels sprouts, kale and many other leafy greens, as well as rutabagas and kohlrabi. Spinach family: beets and chard. Cucumber family: cucumbers, melons, squash and gourds. Pea family: peas and beans. Grass family: corn, wheat, oats and rye. Tomato family: tomatoes, peppers, eggplant and potatoes.

CULTIVATION AND HAND PICKING - The least expensive of all control practices. Must be used long before pest

damage becomes apparent and at the proper stage of development of the insect.

CULTURAL CONTROLS AND/OR PRACTICES - These are the oldest means of controlling insect and mite pest problems. They include such things as parasitoids,

resistant species or varieties, cultivation, crop rotation, soil and water management, a diversity of crops, planting and harvesting schedules, pruning or mowing methods, proper plant selection, nutrition, reducing plant stress, improving soil condition, removal of crop residue and sanitation, all of which can and/or do help and/or provide pest control or reduce and/or prevent pest problems. In 1500 B.C.E. there were writings about cultural control, e.g., manipulation of planting dates. In 950 B.C.E. burning was discussed as a cultural control.

CUP OF SOAPY WATER - If you slowly bring up a cup of soapy water directly under a fly resting on the ceiling, it will fly into it and drown.

CURIOSITY - If the Author had not been or remained curious, none of this book would have been possible.

DEHUMIDIFIERS - When properly installed, dehumidifiers (and/or air conditioners) reduce moisture and many pest problems including termites, mold, carpenter ants, mildew, roaches, sow bugs, earwigs, fungus, etc. are all eliminated or at a minimum greatly controlled. Air conditioners, fans, and/or dryers also help reduce the relative humidity - most insects/spiders/termites/fungus/mold/etc. need high levels of humidity to survive - often if you just reduce the humidity - you can control all of these pests. Add a fan to increase the desiccant action.

DETERGENTS - are surfactants, or surface active agents, basically washing compounds that mix with grease and water; they form a "bridge" between lipophilic substances and water-soluble substances and thus enhance penetration of water, insecticides, oils, or enzymes. Richards and Korda (1948) found that detergents disrupt not only the lipoid layer of the epicuticle but also the protein layers of the endocuticle. The properties rendering a detergent most effective are (1) enough liposolubility to penetrate and emulsify the epicuticular wax, (2) sufficient solubility in water (i.e., not excessively lipophilic), and (3) ability to penetrate the outer cement layer of the epicuticle. Obviously, once the cuticle is comprised by the detergents - insecticide poisons are not necessary to control the insects. Make sure your detergent does not have any hazardous or prohibited "inerts". While detergents are synthetic, some of their ingredients can be natural. Detergents were developed during World War II when the oils needed to make soap became scarce.

DIATOMACEOUS EARTH (DE) - Diatomaceous earth is a mineral product mined from the fossilized silica shell remains of unicellular or colonized algae from the class Bacillariaphyceae, better known as diatoms. There are many different companies that sell DE. The Author recommends the food-grade product sold by Safe Solutions, Inc. Most registered DE has pyrethrin and

pipernoyl butoxide (PBO). Some unregistered (without pyrethrin and PBO) food-grade diatomaceous earth (DE) is safe enough to be eaten, yet will kill most crawling insects. Be sure you have the best quality. Make sure the DE you use meets World Health Organization (WHO) safety standards. WHO cautions that DE with a crystalline silica content over three percent (3%) is dangerous for ingestion by humans or animals. Safe Solutions, Inc. DE has less than 1% free silica. Swimming pool DE ranges from 60% to 70% free silica. The Author does not recommend the use of swimming pool DE. Safe Solutions, Inc. food-grade DE can be used as a dry dust or wettable powder. To make a wettable powder mix, use 4 tablespoons of product per gallon of water and add a ¼ teaspoon of Safe Solutions, Inc. Enzyme Cleaner per gallon of mix. For more information or purchase go to: www.safesolutionsinc.com/Diatomaceous_Earth.htm

DUSTS - Road dust, talcum powder, medicated body powder, bath powder, Comet® cleanser and many other fine dusts kill insects by desiccation and/or suffocation. Dusts clog the spiracles or breathing holes of insects.

DUCT TAPE – The very best duct tape is the Gorilla Brand Duct Tape. Place this duct tape sticky side up and held in place with masking tape to control virtually any and all crawling insects and arachnids.

ESSENTIAL OILS - natural essential oils can repel and/or kill insects and other pests not only because of their scent, but also because of the oil. Insects have an exoskeleton, and those shells are composed of oil-based molecules and when they are exposed to and essential oil it dissolves them. Humans and other animals do not have exoskeletons and we are not oil based, so it does not harm us. However, it is important to dilute essential oils with body oils (jojoba oil, extra virgin coconut oil) if and when you decide you want to wear them as an insect repellents or even as a fragrance.

SAFE INSECT REPELLENTS

As mentioned above it is best to dilute essential oils with vegetable oils when applying to the skin. The reason for this is that some people are very sensitive to pure essential oils and their skin may get irritated because of the high concentration. So add just a few drops (about 5-10 drops) to an ounce or two of extra virgin coconut oil or jojoba oil. Almond, sesame, and avocado oils also work. When camping, hiking, or exploring the outdoors, add 10 drops lavender oil to half an ounce of body oil and apply the mixture around ankles, wrists, behind the neck, and waistband. This mixture will keep away the ticks and chiggers. Lemongrass also works but instead of using vegetable oils, use water, mix vigorously, and apply the mix to clothing in unnoticeable areas (say on the inside of the clothing rather than the outside) around the ankles, wrists, waist and neck.

For pets, it is important to know that they will absorb the oil differently, the best way to keep fleas and other pests off your four legged family member is to keep your pet's living space clean. Also add a few cotton balls with a few drops of Texas Cedarwood oil to the area, where the pet cannot swallow it. If you are worried that your pet might eat the cotton ball, you may want to add 7 to 10 drops of Texas Cedarwood, with 2 to 3 drops lavender oil to an ounce of jojoba oil or almond oil. Rub the mixed oils

onto the fur. Or add a few drops to a bandana or collar. Also be sure to use Safe Solutions Pet Wash shampoo before applying the diluted oils.

Specific Essential Oils for Specific Insects

Ants- Peppermint, Spearmint (add a line of it to window and door seals)

Aphids- Cedarwood, Hyssop, Peppermint, Spearmint

Beetles- Peppermint, Thyme

Caterpillars- Peppermint, Spearmint

Chiggers- Lavender, Lemongrass, Sage, Thyme

Cutworm- Thyme, Sage

Fleas- Lavender, Lemongrass, Peppermint, Spearmint, Texas Cedarwood

Flies- Lavender, Peppermint, Rosemary, Sage

Gnats- Patchouli, Spearmint

Lice- Cedarwood, Peppermint, Spearmint

Mosquitoes- Lavender, Lemongrass

Plant Lice- Peppermint, Spearmint

Mice- 2 teaspoons peppermint to 1 cup water- spray this repellant mix in every room of your home

Moths- Cedarwood, Hyssop, Lavender, Peppermint, Spearmint

Roaches- Cedarwood, Eucalyptus

Slugs- Cedarwood, Hyssop, Pine

Snails- Cedarwood, Pine, Patchouli

Spiders- Peppermint, Spearmint

Ticks- Lavender, Lemongrass, Sage, Thyme

Weevils- Cedarwood, Patchouli, Sandalwood

These Essential oils alone will act as repellants, to transform them into natural insect killers, simply add some water and a dash of soap. And how do you use them? One way is to get a pistol-grip squirt bottle. Mix a few drops of the oil with some water a dash of soap - shake it up, and start firing. If you have bugs on your plants, like aphids on your roses, you can squirt the leaves and drive the bugs away with no harm to your plant. You can do the same with the other pests. As for ants, you can smear a line of peppermint or spearmint across your kitchen counter or floor and the ants won't cross it. If you already have a line of ants invading your house, just draw a line of oil across them and they will turn back. It is fun to watch. And as for flies, you can knock them dead right out of the air with one shot from your pistol grip. There are many other essential oils that you can use for pest control and/or healing!.

ENZYME CLEANERS - The 5th Edition of Truman's Scientific Guide to Pest Control Operations described "The Ideal Pesticide". "Ideally any pesticide will act rapidly on pests, yet be completely harmless to people, domestic animals, wildlife, and other aspects of the environment. Its residues would only last as long as was necessary to create the desired effect, usually for very

short periods. It would also be inexpensive and readily available in necessary quantities, chemically stable (before application), non-flammable, and otherwise safe to use around homes or industrial sites. It would be easily prepared and applied, non-corrosive and non-staining, and it would have no undesirable odor. Unfortunately, no such (synthetic) pesticide exists." Purdue University and Advanstar Communications (Pest Control Magazine) worked on this 1997 Pest Control Manual, but they were, obviously, still unaware the Author, Stephen L. Tvedten, had begun working with and using and field testing the perfect (pesticide) or Pestisafe™ based on natural pest control. In addition to their (perfect pesticide poison descriptive) list, Safe Solutions, Inc. Tweetmint Enzyme Cleaner with (or without) Peppermint is, in the Author's opinion, the finest enzyme cleaner out there and it will never create any pest resistance problems, for it truly is the perfect pesticide and the entire compound contains only ingredients that are considered food grade or GRAS (Generally Recognized as Safe) and can be used virtually everywhere, even when people are sick, under 1, over 60, pregnant and/or chemically sensitive to control even pesticide-resistant pests.

The Author has watched insects and spiders die in 10 - 30 seconds when this particular enzyme cleaner is mixed at a rate of 1 oz. per quart of water. The U. S. EPA prohibits any/all claims that any registered pesticide poison is

either safe or non-toxic. That is just another reason why the Author calls the Safe Solutions, Inc. Enzyme Cleaner with Peppermint a Pestisafe™ rather than a pesticide poison. Insectivore plants produce and also use protease enzymes to digest their insect prey. Spiders produce and inject protease enzymes to predigest their prey and all molting insects produce a small amount of protease enzyme to serve as a chemical "zipper" so they can split open their exoskeletons when they molt and increase in their size; without the protease enzyme they would be trapped inside their own exoskeletons and be crushed to death by their own growth.

Fogging and/or lightly spraying Safe Solutions Tweetmint Enzyme Cleaner with Peppermint in or on gardens, lawns, orchards, fields, swamps, and/or directly on insects, washing floors, linen, clothing, pets, hair, etc. will quickly and safely result in virtually instant pest control. We strongly recommend you only use diluted Safe Solutions, Inc. Enzyme Cleaner with Peppermint (that contain protease enzymes) to control virtually all mites, arachnids, insects, fungus, mildew and mold pests. Most enzyme products or cleaners available at swimming pool supply or cleaning or janitorial supply houses use bacteria to create "their" enzymes, e.g., pet mess cleaners, drain openers and septic tank cleaners - some of the bacteria or acidic pH may be harmful to you and yours and none of them are patented or tested for this use. Use

the U. S. patent pending and Australia patented Safe Solutions, Inc. Enzyme Cleaner with Peppermint at a rate of 1 oz. per quart of water to clean virtually everything and incidentally to control virtually all indoor pests or 1 - 2 oz. per head for lice control, or 1 oz. - 2 oz. per dog for flea control, or 1 oz. - 2 oz. per 3 gallons of water as a soak for ant nests, or 1 oz. per 4 gallons of water for agriculture use, or 1 oz. per gallon of water or for use as a floor cleaner.

The body surface of insects consists of a hard skin known as the cuticle - the major pesticide pathway is cuticular penetration. The insect cuticle is hydrophobic so that it can resist desiccation and drowning but the Safe Solutions, Inc. enzymes and surfactants quickly and safely cut through this protective shell. Synthetic pesticide poisons use light oils, dusts and/or volatile solvents to help penetrate this same cuticle. Caution: Remember, even these Safe Solutions enzymes will kill all insects including beneficials - so use them outside with great discretion! Note: You can adjust the Safe Solutions, Inc. Enzyme Cleaner dilution rate (1 - 250 or about 1/2 oz. of enzyme cleaner per gallon of water) when spraying to control soft-bodied pests, e.g., aphids - lady bugs and other beneficials will not be destroyed at this rate. Gabriel Cousins, M.D. has stated, "All life depends on enzyme function. When our enzymes are deplete, so is our vital force and health." Be careful to

spray a few leaves and check if any plant is sensitive before you spray the entire plant. You should also spray a small area first to see if there is any sensitivity or staining before washing to spraying the entire animal, plant or area. You can purchase Safe Solutions, Inc. Tweetmint Enzyme Cleaner with Peppermint by calling the office at 1-888-443-8738 or online from www.safesolutinsinc.com. This cleaner is not sold by Safe Solutions, Inc. as a pesticide even though it is so registered by the Michigan Department of Agriculture. Please see: www.safesolutionsinc.com/Enzyme_Cleaner_Pest_Contrc

EPSOM SALT - Epsom salt mixed with bran and molasses keeps away grasshoppers and other crawling pests. Lightly sprinkling epsom salt on the leaves of your greens also keeps away animals like deer, groundhogs, and rabbits who would otherwise chew the leaves of the plants. The salt is also an effective deterrent to beetle, slug and snail infestations. However, be careful that you do not douse your plants with too much of this salt; Epsom salt is known to damage the roots of plants. On the other hand, make sure that you reapply an Epsom salt repelling solution to your plants after watering or a heavy rain.

EPSOM SALT BATHS - Researchers and physicians suggest these health benefits from proper magnesium and

sulfate levels, as listed on the web site of the Epsom Salt Industry Council:

• Improved heart and circulatory health, reducing irregular heartbeats, preventing hardening of the arteries, reducing blood clots and lowering blood pressure.

• Improved ability for the body to use insulin, reducing the incidence or severity of diabetes.

• Flushed toxins and heavy metals from the cells, easing muscle pain and helping the body to eliminate harmful substances.

• Improved nerve function by electrolyte regulation. Also, calcium is the main conductor for electrical current in the body, and magnesium is necessary to maintain proper calcium levels in the blood.

• Relieved stress. Excess adrenaline and stress are believed to drain magnesium, a natural stress reliever, from the body. Magnesium is necessary for the body to bind adequate amounts of serotonin, a mood-elevating chemical within the brain that creates a feeling of well being and relaxation.

• Reduced inflammation to relieve pain and muscle cramps.

• Improved oxygen use.

• Improved absorption of nutrients.

• Improved formation of joint proteins, brain tissue and

mucin proteins.

• Prevention or easing of migraine headaches.

The Author believes that besides the above benefits - epsom salt baths and sprays will control scabies and other skin problems. They work especially well if you add 3 to 4 ounces of Safe Solutions Enzyme Cleaner to

the bath water. Note: If you soak a splinter in an epsom salt solution - it will draw out the splinter. You can also add clove oil, tea tree oil, oregano oil and/or lavender oil to the bath, or you can apply them topically (if you are not pregnant or sensitive). Always check first using a diluted small amount.

There are many different brands of Epsom salt, but they are basically all the same chemically, and can be found at most drug stores. Add two cups of Epsom salt (provided you are not allergic to sulfur) and one-half cup olive oil or baby oil and some alfalfa tablets. The oil will help keep your skin moisturized, and it will also help prevent mites from surfacing for air. Chlorophyll may play an important role in detoxing the body of many poisons. Add these three items to your warm bath water and then soak for at least 12 minutes. Do this three times weekly.

(Please also read the Human Lice and Scabies Chapter of this book.)

If you are pregnant or have any health concerns, check with your doctor before using Epsom salts.

EX-LAX® - When fed to rodents, laxatives will literally make them defecate themselves to death.

EXCLUSION - Keep pests from entering with screens, properly fitting doors and windows, caulk, cement, rodent guards, etc. You can fill large voids/cavities with aerosol foam insulation. Screening Caution: Screening will severely restrict air flow into vents, so if you need to screen vents, build a box with a surface area large enough to allow proper air flow. Your screen manufacturer will provide you with tables that determine how much the air flow will be restricted.

EXPERIMENT - There will always be something new. Your efforts to find a better way have to precede all your other efforts - then share what you discover with others. Einstein noted that “the process of scientific discovery is in effect a continual flight from wonder,” and that “everything that is really great and inspiring is created by the individual who can labor in freedom.”

EXTRACTS - of pumpkin, cucumber, garlic and many hundreds of other plants have been found toxic to nematode parasites and other pest species in animals and the soil. Extracts from plants have great pesticidal value and potential as killers, repellers and/or inhibitors.

FANS - will control roaches in kitchens if left on 24 hours a day for several weeks and when used outside will safely keep mosquitoes at bay. To control odors, VOCs,

dust and dust mites take a (square box) window fan, using duct tape attach one furnace filter to the fan grill on the intake side. Turn on the fan and it will filter dust and mites from the air - use activated charcoal filters and you also remove odors, pesticides and increase filtration results. Change charcoal filters as needed.

GUINEA HENS OR GUINEA FOWL - The domesticated Guinea hens (cousins of pheasants) are often used for pest control. Guinea hens are meat eaters and will rid your property of many pests, e.g., ticks, slugs, Japanese beetles, grasshoppers, mice, rats, snakes and most bugs in the garden or yard. They have an acute awareness of predators and will act as watch dogs day or night to alert you of predators or unfamiliar people within their habitats. Guinea hens do all this and still leave your plants, vines and garden foliage basically unharmed.

Try a pair today.

HAIR DRYERS - can be used to control fungus and roaches and spiders and many other pests - simply direct the hot, dry air at them or where they hide and see what happens next. You can also use a commercial heat gun to do the job quicker.

HERBAL TEA SPRAYS - After preparing the following plants in a water solution:

Burdock - Has been used against June beetle grubs.

Camomile - Against damping-off in greenhouses and

cold frames.

Cayenne Pepper - Against caterpillars and fleas.

Chive - Against leaf and fruit scab.

Elderberry Leaves - Controls blight, caterpillars and flea beetles.

Garlic and Onion - Against late blight on tomato and potato and brown rot of stone fruit; red spiders and aphids. This mix is also a powerful antibacterial product that destroys many plant diseases.

Gooseberry - Against mildew.

Horseradish - Against fungi.

Horsetail (Equisetum arvense) - Against mildew and other fungi, especially on grapevines, vegetables,

fruit trees and rose bushes.

Hyssop - Against bacterial diseases.

Pumpkin or Squash Leaves, Freshly Cut, a decoction of black walnut leaves soaked overnight or an

infusion of pignut leaves, rubbed on horses or cattle will repel flies

Rhubarb - Against club root, greenfly and blackspot.

Stinging Nettle - Against plant lice (aphids).

Tomato Leaves - Against aphids, grasshoppers, caterpillars and flies.

Wormwood - Against leaf-eating caterpillars on fruit

trees and aphids.

NOTE: Many herbs, through their essential oils, have natural insecticidal, fungicidal and bactericidal properties.

HORTICULTURAL OILS - include dormant oils, suffocating oils and summer oils. They are used as insect smothering

or suffocating agents. Horticultural oils are summer oils. Several things distinguish summer oils from dormant oils. Summer oils leave more unsulfonated residues and are less likely to burn tender plants. Summer oils are mixed with wax and can be used as a leaf polish and have good “spreading” properties and are safer and easier to use.

HOT PEPPERS - e.g., chili piquin or habenero chiles can be placed in vinegar; add a little salt and seal for at least a week; then strain and use it as a spray and/or “paint” wood to repel horses, rodents, termites, snails, reptiles and other pests. Use Ghost Pepper if the above peppers fail.

IMAGINATION - this is the greatest pest control "tool" ever - some people have no imagination and are doomed to only use more and more "registered" poison to "control" less and less their pests. Look around, think, ask and develop new tools all of the time. Imagination combined with intelligence can not be beaten. Imagination is more important than knowledge.

Knowledge is very restrictive; imagination is unlimited. Your brain is 200,000 times bigger than that of the insect pest, so use it and you will win; use volatile, "registered" pesticide poisons and you will lose!

INNOVATION - Develop the right idea and it will fly! But remember Anyone that dares to discover or invent revolutionary discoveries for the welfare of mankind is attacked as a “quack”. On page 206 of Great Scientists by Gordon Ross, we read, “His opponents called (Louis) Pasteur a circus performer, a charlatan and a clown. Pasteur bore all this continually with a patient smile. ‘A man of science’, he explained to his wife, ‘should think of what will be said of him in the coming centuries, not of the insults or the compliments of the present day.’” Anyone that challenges “thinking” or “sound science” of his day will become the center of storm and controversy.

INSECT REPELLENTS - You can make an effective insect repellent using 75% coconut oil, 15% water, 4% soybean oil, 3% geranium oil and 3% vanilla. You can also lightly rub Vicks VapoRub®, Noxema®, cedar oil, lavender oil, pennyroyal oil, sweet basil, peppermint oil, citronella oil, eucalyptus oil or scented geraniums on your body and clothes. Dilute all fragrant oils in coconut oil, vegetable oil or almond oil first. A strong infusion of chamomile tea can be applied to the skin or fur to repel insects. Baby powder with talcum will repel many

crawling insects Always test a small area of your skin (with a small amount) to see if you get a reaction before treating the entire area or body. Please see: www.safesolutionsinc.com/Nontoxic_Bug_Repellent.htm

KNOW YOUR ENEMY - To solve a pest problem you need to know everything you can about your enemy so you can properly and safely control it.

LADYBUGS (LADY BEETLES) are almost indispensable for fighting aphid problems. It is technically a beetle and grows to about 1/4 inch long. Ladybugs cause no plant damage at all and are sold in garden centers everywhere. They will eat large amounts of aphids and then fly onto another plant to eat some more.

LIGHTS - Can be used to inspect or repel or attract pests. Red light as the only light source allows you to check for roaches and carpenter ants at night. Black light makes rodent urine and scorpions fluoresce. Yellow light (bug lights) and sodium vapor lighting will not attract as many insects. Regular (white) or black light can attract insects to your trap or vacuum.

MECHANICAL PEST CONTROLS - Use natural or physical controls first, e.g., hoes, swatters, traps, caulking, exclusion, repairs, decoys, sanitation, step on the bugs, birds, bats, toads, handpicking, fences, sanitation, screens, doors, doorsweeps, bacteria, mowers,

fans, vents, predators, parasites, washing, drying, vacuuming, etc. to kill or remove pest problems. In 1763, Linnaeus won a prize for an essay he wrote under the name C. N. Nein on how caterpillars could be removed from orchards. He suggested both mechanical and biological controls.

MINT - This is a very effective insect repellent that you can use inside your home and outside your garden. You can place a few mint tea bags in areas where you usually find insects and bugs. You can also place them in your cupboards, pantries, or other kitchen nooks and crannies. Mint is perfect for ants, weevils, and lice.

MOWING - Proper mowing decreases flower and seed production and controls many diseases and pests. For example, mowing poison ivy closed to the ground in midsummer, followed by plowing and harrowing and/or by grazing will control this noxious pest. Mowing can remove over 90% of the black cutworm, Agrotis ipsilon, but remove the clippings and remember the cutworm larvae will survive about half of the time and crawl 75’ or more to reinfest. Mowing before sunrise catches the peak cutworm activity and can remove 100% of cutworm larvae.

Proper mowing also helps destroy ticks.

Mulch - Nearly any organic material can be used as mulch. Mulch 3” - 4” deep will safely suppress and/or

smother many weeds, especially when used in combination with a geotextile fabric. Some mulches may be acid or alkaline, causing problems with the soil's pH. Sawdust will use up nitrogen as it decomposes, so mix in some grass clippings if you use sawdust. The color of plastic mulch can affect plants. Basil developing above red mulch had better succulence and fresh weight and greater area than basil plants grown above black mulch.

When basil is grown above green or yellow mulches, the basil plant develops significantly higher concentrations of aroma compounds and phenolics than basil plants grown above white or blue mulches. Red mulch produces larger tomatoes and sweeter, tastier strawberries. Color can and does affect the roots, stems, leaves, seeds, fruits and/or vigor of many food and/or crop plants. Mulches help control weeds and reduce moisture evaporation

from the soil surface. They also help to prevent rot caused by fruit fruit coming in contact with bare soil. When tilled under, organic mulches become valuable soil amendments.

MULTIPLE CONTROLS - Often one control will not work, so use several in order to eliminate pest problems. To only use one control is like a prize fighter trying to win by only using one type of punch.

NATRIUM MURCATIUM - is the fancy schmancy way of saying sodium chloride, table salt. This simple product

will kill lice and scabies. Common salt is one of the most important elements in the world. It occurs naturally, in sea water, as crystals of rock salt and as large deposits formed by evaporating lakes and seas. It is the conduit in our body's neurological system. Salt was a form of money to the Roman soldiers (Salarium) and the word 'salary' was derived from this Latin word. Possible side effects include depression, irritability, congestion, loss of smell and taste, canker sores, heartburn, nausea, aches and pains, etc. An ounce of salt in a gallon of water will kill spider mites. A tablespoon of salt in 2 gallons of water will kill cabbage worms

NATURAL ENEMIES - The best control of pest populations are their natural enemies. In the Central Valley of California, after widespread applications of DDT to citrus and other crops in 1946, the Vedalia beetle, which preys on cottony-cushion scale, was practically destroyed. The cottony-cushion scale was not destroyed by DDT and increased greatly. Only after the DDT residues were no longer toxic to the Vedalia beetle and this beneficial was once again established in the citrus groves, was the natural balance once again restored.

OILS - Have been used for years as adjuvants and for pest control. In 200 B.C.E. the Roman, Cato the Censor, advocated oil sprays for pest control. Diluted oils that are plant-based (canola, castor, coconut, corn, etc.), mixed at

a rate of 1 tsp. oil and 1 tsp. soap or Safe Solutions Tweetmint Enzyme Cleaner in 1 gal. water (You can add some chamomile or compost tea) will help prevent fungus and pest and disease problems. You lightly spray daily for the first week; then weekly and/or as needed. DO NOT SPRAY ON FUZZY LEAF PLANTS OR THEY WILL BURN!

OILS: dormant oils, horticultural superior oils, Volck Advantages: No residues on fruit when applied prebloom. Effectively controls many overwintering pests.

Disadvantages: Must be applied while tree is dormant, though lighter weight oils are being developed that can be used in spring and summer. Must be applied when temperatures are above 40° F but below 80° F for several hours to avoid injury.

Oils can be used to control insects, mites or plant pathogens. Oils are generally effective against soft-bodied insects such as aphids, scale crawlers, mealy bugs, spider mites and whiteflies. Small larvae of some caterpillars and sawflies may also be controlled with oils. Dormant oil sprays are also used against overwintering eggs and scales. Horticultural plants oils are commonly used to suppress certain fungal diseases like powdery mildew and black spot on roses. When applied to the plant, a thin film of oil must thoroughly cover the target insect or mite. The oil plugs the spiracles or pores

through which the insect breathes and the insect dies by suffocation.

Oils can also disrupt insect membrane function or structure and can also disrupt feeding by the insect. When used against plant pathogens, oils may smother fungal growth and reduce spore germination on treated surfaces.

Apply dormant oil sprays only after winder hardening has occurred. Some neem oil products contain an additional active ingredient, azadiraction, which is an insect anti-feeding agent and insect growth relator. When applying oils, it is best to agitate hand pump sprayers frequently and keep tank spray agitators running to reduce the risk of oil separation. Remember, oils can injure susceptible plant species. Symptoms include leaf scorching and browning, defoliation, reduced flowering and stunted growth. Do not treat stressed plants and apply when conditions are lower than 85o F. and 90 percent humidity. The longer wet oil sprays remain on foliage, the greater the chance of phytotoxicity.

OLIVE OIL - Olive oil is known for its smothering abilities and it will kill lice and scabies and many other insects and can be added to soap water solutions to help control pests. Olive oil heath benefits are: Reduces LDL (bad) cholesterol; lowers blood pressure; decreases blood sugar levels; increases the absorption of vitamins, e.g., A, D, E and K; stimulates the bladder to secrete bile, which

helps prevent gallstones; promotes cellular growth; speeds healing and helps the metabolism. No wonder why olive oil is so present in the scriptures. Helicobacter pylori is linked to a majority of peptic ulcers and to some types of gastric cancer, and resistance of the microorganism to antibiotic treatment is now found worldwide. Virgin olive oil is an unrefined vegetable oil that contains a significant amount of phenolic compounds....that are stable for hours in this acidic environment. They exert a strong bactericidal activity against eight strains of H. pylori, three of them resistant to some antibiotics. Among the phenolic compounds, the dialdehydic form of decarboxymethyl ligstroside aglycon showed the strongest bactericidal effect at a concentration as low as 1.3 g/mL. So, virgin olive oil is a potential chemopreventive agent for peptic ulcer or gastric cancer, but this bioactivity should be confirmed in vivo in the future. Source: Journal of Agricultural and Food Chemistry Volume 55, Pages 680-686, “In vitro activity of olive oil polyphenols against Helicobacter pylori” Authors: C. Romero, E. Medina, J. Vargas, M. Brenes, A. de Castro www.healthsalon.org/69/helicobacter-pylori-is-linked-to-a-majority-of-peptic-ulcers-olive-oil-helps-2/

PETROLEUM JELLY - Many insects are attracted to yellow, white, or blue colors - use an index card as a trap by covering it with sticky petroleum jelly, STP® or honey - most insects, e.g., earwigs are repelled by

petroleum jelly - so you can use sticky petroleum jelly to make your roach traps escape proof. Most insects will not cross over petroleum jelly barriers, so use them to "fence out" pests.

PLAIN WATER - a strong stream is effective in destroying aphids, mealy bugs, mud dauber nests, and red spider mites. It also makes cats and dogs leave your yard quickly.

PLANTS - Certain plants contain aromatic properties that either invite beneficial insects and/or repel harmful insects. Beneficial insects prey on pests that cause damage in the garden. Ladybugs and praying mantis are good examples of beneficial bugs. Using plants for pest control will truly cut down on your pest control workload, but remember to only choose plants that are native to your area. This way beneficial insects will already know what to look for. Artemisia - This plant produces a strong antiseptic, although not unpleasant aroma that repels most insects. Planted in drifts it can also deter small animals. Basil -The oils in basil are said to repel thrips, flies and mosquitoes. Basil and rue should not be planted together. Bee Balm - Attracts bees to your garden. Borage - This plant repels tomato hornworms and cabbage worms and attracts beneficial bees and wasps. Borage also adds trace elements to the soil. Catnip - Will attract cats but will repel flea beetles, aphids, Japanese

beetles, squash bugs, ants, and weevils. Chives - Chives will repel Japanese beetles and carrot rust flies. It has also been said that chives will help prevent scab when planted among apple trees. Chrysanthemums -White flowering chrysanthemums are said to drive away Japanese beetles and C. coccineum, commonly known as Painted Daisy, kills root nematodes. Dahlias - Dahlias repel nematodes. Dill - Dill is best planted with cucumbers and onions. Dill attracts hoverflies and predatory wasps, and its foliage is used as food by swallowtail butterfly caterpillars. Tomato hornworms are also attracted to dill, so if you plant it at a distance, you can help draw these destructive insects away from your tomatoes. Dill also repels aphids and spider mites and the sprinkled leaves will help to repel squash bugs. Four O'Clocks - This plant is a favorite food for Japanese beetles. However, because of its poisonous foliage rarely do they get to finish their "last meal". Caution: Four O'Clocks are also poisonous to people and animals, so avoid planting them if you have small children or pets. Garlic - Garlic planted near roses repels aphids. It also deters codling moths, Japanese beetles, root maggots, snails, and carrot root fly. Hyssop - Hyssop is great for attracting honeybees to the garden. Lavender - Lavender is a favorite among many beneficial insects and also repels fleas and moths. Marigolds - The marigold is probably the most well known plant for repelling insects. French marigolds repel whiteflies and kill bad nematodes.

Mexican marigolds are said to offend a host of destructive insects and wild rabbits as well. If you choose marigolds for your garden they must be scented to work as a repellant. And while this plant will repel many bad bugs, it also will attract spider mites and snails. Nasturtiums - Plant nasturtiums with your tomatoes and cucumbers as a way to repel wooly aphids, whiteflies, squash bugs, and cucumber beetles. Their flowers, especially the yellow blooming varieties, act as a trap for aphids. The Author loves to eat Nasturtiums. Petunias - Petunias will repel asparagus beetles, leafhoppers, a range of aphids, tomato worms, and a good many other pests. Sunflowers - Ants will literally move their aphid colonies onto sunflowers. The sunflowers are usually tough enough that they suffer no damage from the aphids.

PLANT OILS - e.g., mint oil, pine oil, caraway oil, act as an insecticides, acarcides, fungicides and sprout inhibitors; they work because they are neurotoxic to insects, targeting octopamine receptors in their brains, so the insects become hyperactive, erratic, stop eating and/or convulse. People and animals do not have receptors or a system octopamine, so most plant oils do not harm most of us.

RED LIGHTS - let you get close enough to roaches, carpenter ants and other nocturnal pests to “pet” them, so simply vacuum them up. Put corn starch (1 tablespoon) in

a dry vac or 4 oz. of enzyme cleaner in a quart of water in a wet vac to kill the pests you vacuum up.

SALT - Salt sprinkled on weeds that sprout in paved areas, along fence lines, driveways or wherever you want - salt will kill all plants including "weeds"; salt or salt water sprays will also kill snails and slugs. Salt will kill fleas and lice on people or animals and termites and numerous other pests. CAUTION: It will damage plants and will not remove nits. Many salts can be used to pretreat soil and wood for termite control, but some salts will also destroy ferrous metals, e.g., nails.

SAND - sand blasting sand will provide a permanent termite barrier when properly applied. Sharp sand will repel cutworms and other insects. Putting clean sand under lettuce plants will help prevent rot.

SANITATION - Improve your sanitation; store food and garbage properly; use heavy-duty trash bags; move dumpsters away from buildings; refrigerate trash and recycle rooms; steam clean garbage receptacles routinely; remove all debris, garbage, spilled food, garden refuse, trash, boards, branches, wood piles, lumber, weeds, rocks, etc. and you can virtually eliminate most pest problems inside and outside. This is usually the number one problem.

SAUNA - Dry saunas may be used to safely kill or control lice, scabies and bed bug infestations and many

other insect infestations. Saunas can also be used to detoxify people.

SOAPS - Soaps are also surfactants, but they are made with natural ingredients; they may be used as alternatives to control insects, algae, moss and weeds. Mix 4 ounces of virtually any soap - mild (unregistered) dish soap or a natural soap or a commercial cleaner or a degreaser in 1 gallon of water and spray as an insecticide to quickly control most insect pests or use an (registered) insecticidal or herbicidal soap, e.g., Safers® or Ringer®. Be sure your cleaner does not contain alkylphenol polyethoxylate - which is a hormone disrupter. Spray floors and yards to control ants and fleas. This mix will also control many insects, e.g., white flies, mites, aphids, etc. Spray a few leaves and wait 48 hours if there is no ill effect - spray your plants every 2 - 3 days for several weeks. Caution: Some plants and beneficial insects are very sensitive to small amounts of soap. Use 1 tablespoon of dish soap and 1 teaspoon of vegetable oil for each quart of water and spray to control aphids, spider mites, scales, some caterpillars and mealy bugs - this "brew" is effective against eggs as well as adults. If it is sunny and/or the temperature is over 850 F. the oil may damage some foliage. Deodorant soaps especially Dial® can repel deer and other animals. Sprinkle dry soap into garbage cans after they have been washed and allowed to dry; it acts as a fly repellent. Sprinkle or spray Tide laundry

soap around the foundation of your home to keep ants out. At 40o F. or less spraying birds with soapy water will quickly kill them. The "original" Pestisafe®. Soap and water - When Grandmother finished washing the dishes she threw the soapy water on her plants and flowers controlling most insect pests quickly and safely. Soap has been used successfully since 1100 AD by the Chinese for pest control.

SPRAY BOTTLE CURES - Non-toxic "pesticide" sprays that can be made from ingredients readily available in the home. We prefer to call them Pestisafes®.

All-purpose - Take an empty spray bottle and fill about ¾ of the way with water, then add a few drops of Ivory liquid soap, some hot peppers or hot pepper sauce and some garlic. This works well, but needs to be reapplied after every storm and/or every couple of weeks.

All-purpose - Grind together three hot peppers, three large onions, and at least one whole clove of garlic. Cover mash with water and place in a covered container. Let container stand overnight. Strain mixture through cheesecloth or a fine strainer and add enough water to make a gallon of spray.

All-purpose - Mix one tablespoon of a mild dish washing detergent plus one teaspoon of a vegetable cooking oil with one quart of water. This can be sprayed on all plants. Remember to spray both the top and the underside of the

leaves. You can also add 1 teaspoon (rounded) of baking soda if you have fungus problems.

All-purpose - Finely chop 10 to 15 garlic cloves and soak in 1 pint of mineral oil for 24 hours. Strain and add enough water to make a gallon of spray. Test on a few leaves to see if the plant is damaged and spray as is, or add a few drops of soap for extra stickiness.

All-purpose - Blend ½ cup of hot peppers with 2 cups of water. Strain and spray.

All-purpose - Combine 1 to 2 cups of rubbing alcohol with 1 quart of water. Test spray and let stand overnight to see if damage occurs to plant.

Orange trees and rosebushes - Soak macerated tomato, rhubarb or oleander leaves in water and apply as spray onto leaves and branches. Be careful; these leaves are very toxic. Red spider mites, spiders, cabbage worms, and weeds - An ounce of table salt to a gallon of water has been shown to stop these pests. Use a tablespoon of salt to two gallons of water for the worms. Be careful - salt damages plants! Straight salt, especially in non-garden areas can stop weeds and termites in protected areas, e.g., crawl spaces, but can kill plants and harm ferrous metals.

Species specific - Collect ½ cup of a specific pest and mash well or blend. Mix this with two cups of water and strain. Mix ¼ cup of this "bug juice" with 2 cups of water

and a few drops of soap and spray.

Caution: Some sprays can damage, discolor, kill or scorch foliage or irritate people or pets - always test a small, inconspicuous area first before treating the entire area, pet or person!

SPIDERS - The weight of insects eaten by spiders every year is greater than the total weight of the entire human population!

STEAMERS - Steamers are just entering the marketplace. The Author has used steamers to not only clean but to control pests and disinfect bacteria with steam.

SURFACTANTS - Are slightly viscous, clear amber substances or colloids that work as ("magnetic") cleaners and degreasers. Surfactants can be used as household, industrial and marine cleaners, personal hygiene products, insect repellents and pest (and bird) control compounds. A micelle is a colloid, microscopic particle formed by an aggregation of small biodegradable molecules. Each molecule has a hydrophilic (water-seeking) pole and a hydrophobic (water-repelling) pole. The hydrophobic poles attract each other, forming the interior of the micelle and the hydrophilic poles form the outer surface. When a single micelle or surfactant molecule comes in contact with a hydrocarbon molecule (grease, oil, wax, binders, etc.), the hydrophobic center of

the micelle or surfactant quickly bonds via homologous attraction to the hydrophobic hydrocarbon site, locking it into a colloidal suspension, pulling the hydrocarbon into the micelle and lifting the hydrophobic hydrocarbon molecule from its original surface. This emulsification process easily penetrates highly viscous, dirty and/or sticky materials, lifting them off. Unregistered surfactants are routinely added to or used in pesticide poison formulations, but we have found they often work better alone. If sprayed all alone, some "regulators" then call these same surfactants "unregistered pesticides". Because the exoskeletal structures, wax and joints of insects are basically all comprised of hydrocarbon molecules, insects, gnats, mosquitoes, flies, etc. may avoid surfaces upon which diluted surfactants or (colloidal) micelles have been sprayed for two days or more. When sprayed directly with surfactants, (which cause the micellation) insects, mites, mold, bacteria, etc. will all die quickly because of the lifting of hydrocarbon molecules (they literally are dismantled)! Surfactants are considered to be biodegradable and basically innocuous to people and pets, but will often kill fleas, lice, ticks and other pests while washing or upon contact. If ingested, they may cause diarrhea primarily due to the emulsification of grease and oil in the digestive tract. The surfactants in Safe Solutions, Inc. Enzyme Cleaner with Peppermint are basically the same as those found in a dish detergent.

TALCUM POWDER AND/OR MEDICATED BODY POWDERS - Control and/or repel many pests when sprinkled around. Some people consider talcum powder to be carcinogenic and/or dangerous - but, given the opportunity to choose using a little talcum powder that actually stops most ants including fire ants immediately or using some volatile poison that does not work as well – The Author would choose talcum powder – the Author's answer is very simple when you consider the question in reverse would you prefer to dust a baby's bottom with talcum powder or a "registered" poison? Actually there are grades of talcum powder - some contain asbestos and are not safe - as far as the Author knows baby powder does not contain asbestos. Talcum powder quickly dries out the insect and/or clogs their spiracles and, thereby, kills many insects. Talc (non-asbestos form) does typically contain crystalline silica at levels greater than 0.1% but less than 1.0%. Silica has been determined to be a Class 2A carcinogen by IARC. Repeated exposures can cause talcosis, a pulmonary fibrosis, which may lead to severe and permanent lung damage, possibly leading to disability and death, so use it with care. The Author would also mention that talc is an ingredient in Tums Antacid/Calcium supplement. The Author has controlled cockroaches , ants and many other insect and arachnid pests in many schools simply by applying talcum powder in a power duster. Try to use

corn starch as a replacement in vacuums to suffocate vacuumed pests; always pick the safest alternative.

“Teshuvah” - growth toward G-d, is a process of experimentation. “Failures” are as much a part of the process as “successes”.

TEMPERATURE - Increase or lower temperatures even 30o to 40o and you safely and quickly control many insect pests - change the temperature even more drastically and/or quickly and you can control virtually all pests. Unlike mammals, many cold-blooded organisms (insects included) are at the mercy of quickly changing temperature extremes. If climatic temperature increases occur over a developmental period of months or years - a given insect may gradually acquire the ability to survive, this is termed "acclimatization". If an insect can overcome gradual temperature stresses in days, hours, or even minutes this short-term adjustment is called "acclimation". Most insects quickly die if you quickly change their temperature. Cold - Insects are cold-blooded animals, meaning that their body temperature is similar to that of their surroundings. They do not maintain a body temperature as do mammals and birds. Most insects do not develop or function well at temperatures below 50 F. This base temperature varies a few degrees up or down, depending on the insect species, but is near 50 F for most insects. When the temperature hangs between freezing

(32 F) and 50 F, insects typically go into a dormant state in which body functions are greatly slowed down. An interesting feature is that plants appear to develop at temperatures somewhere in the 30s and above. When temperatures hang in the 40s for an extended period in the spring, plants continue to expand leaves and grow stems, and they can get ahead of their insect pests that are present but not developing. As a result, insect pest populations may be typical, but plant damage caused by those pests may be much less than normal. At Winter when temperatures below freezing, many insects that are present during the summer die. However, many spring occurring insects survive temperatures in the 20sF, becoming active again once temperatures rise above 50 F. Fewer species survive temperatures that drop into the teens. Insect populations typically do not emerge at once. Some hatch from overwintering eggs or emerge from overwintering pupae early, and some of the same species emerge later. A major guideline to follow when using freezing to control insect pests is to expose them to temperatures that drop as low as possible, as quickly as possible, for as long as possible. A practical recommended treatment is -4°F for one week. Heat - A temperature of 130-140 ºF, maintained for 24 hours, is essentially all that is required to kill insects. Heat is pervasive and insect kill is instantaneous when target temperatures are attained. To ensure effective treatment

using heat there needs to be sufficient air circulation to achieve the desired temperature uniformity throughout the space or enclosure being treated. Most industrial equipment and materials can cope with heat treatment without damage.

THAI LEMON GRASS - (Cymbopogon citratus) is a natural and effective mosquito repellent. It contains the natural oil, citronella, which is safe and effective; in fact, lemon grass citronella is considered more effective than true citronella as an insect repellent. You can buy Thai lemon grass at garden centers and supermarkets, and it grows readily into a clump about 15" across and about 2 ft. tall. To use as a mosquito repellent, break a stalk off from the clump, peel off the outer leaves, until you find the scallion-like stem at the base. Bend the stem between your fingers, loosening it, then rub it vigorously between your palms - it will soon become a pulpy, juicy mass. Rub this over all exposed skin, covering all of the skin thoroughly at least once. You can also make a tincture using alcohol, for spray applications. Plantings around the patio will also help repel mosquitoes.

TRAPS – there are many traps you can either build or purchase to control crawling or flying insects, arachnids, rodents, birds, reptiles and mammals

ULTRAVIOLET LIGHTS - www.safesolutionsinc.com/UV_Disinfection_Light.htm.

VACUUMS - Vacuums quickly remove insects, spiders, food, debris, eggs, body parts, etc. - if you are dry vacuuming up live insects or pests be sure to put a little talcum powder or corn starch in your bag first to suffocate the pests - use a HEPA filter and a red light at night to get nocturnal pests, e.g., roaches. Use a dusting brush to vacuum up spider mites on the underside of leaves or whiteflies both from the air and on household plants. If you use a rinse-and-vac, be sure to include some soapy water to drown the pests.

VENTILATION - Moisture reduction by proper (basement, crawl and attic) ventilation, fans and/or dehumidifiers, plumbing and rain gutter repairs, roofing etc. is a primary factor in controlling most structural insects and fungal problems. Excessive moisture attracts or creates conditions favorable to many insect, fungus and mold problems.

VEGETABLE OILS - Because they can not run away or fight, seeds and plants have evolved many ways that help them to avoid being eaten. Unknown active ingredients in their oils, paired with their natural ability to smother the breathing pathways of invertebrates and hamper their mobility to move - can be used to create a safe, natural pest control alternative, A variety of natural oils are known to individually keep insects and fungi at bay, including castor oil, You can take virtually any safe and

inexpensive cooking oil, like canola or olive or soybean oil and using a small processing machine you can easily turn any vegetable oils into an emulsion using various safe surfactants to safely control most agricultural pests.

VINEGAR - Spray weeds and pest plants with vinegar. White vinegar will also kill ants. Vinegar attracts wasps, fungus gnats and fruit flies - put 2" in a long necked bottle - add a few drops of liquid soap or enzyme cleaner - and they will crawl in and won't be able to crawl out. To deodorize concrete, scrub with Safe Solutions, Inc. Tweetmint Enzyme Cleaner with (or without) Peppermint or a solution of half white vinegar and water or undiluted denatured alcohol as needed. Vinegar is an acid that can be used to soothe the alkaline sting of a wasp. Mix 3 parts vinegar (10% acidity) with 1 part dishwashing soap and spray weeds to kill them. White vinegar sprays repel cats and small dishes of white vinegar absorb odors. Vinegar: This is also an excellent pest control method that can effectively get rid of fleas and roaches. You can create a mixture of vinegar and water, and spray it around your house. If you do not like the smell of vinegar, you can use lemon juice instead.

THE USE OF VINEGAR AND HYDROGEN PEROXIDE TO DISINFECT - Now, you can safely disinfect your home and food - without exposing your family to toxic synthetic chemicals. You can make your

own inexpensive sprays that actually work better disinfecting than any commercial synthetic disinfectant. All you have to purchase from the drug store is some (fresh) three percent hydrogen peroxide and some plain white or apple cider vinegar from the grocery store. Put them full strength in their own clean spray bottles. If you want to safely disinfect vegetables or fruit, just spray or thoroughly mist them with the vinegar and then the hydrogen peroxide (or the hydrogen peroxide and then the vinegar) , and then rinse them off under running water. Using first one spray and then the other, you can also safely and effectively disinfect food preparation surfaces and other washable surfaces and materials. You won't cause stains on most surfaces, nor will you have any lingering taste of vinegar or hydrogen peroxide on your food, and you will not harm you or your family or the environment. From Our Toxic Times, May 2001: Heinz Company spokesperson Michael Mullen references numerous studies to show that a straight 5% solution of vinegar—such as you buy in the supermarket—kills 99% of bacteria, 82% of mold and 80% of germs (viruses). He noted that Heinz can't claim on its packaging that vinegar is a disinfectant since the Company has not registered it as a pesticide with the Environmental Protection Agency (EPA). In tests run at Virginia Polytechnic Institute and State University, pairing the two mists killed virtually all Salmonella, Shigella, or E.coli bacteria on heavily

contaminated food and surfaces when used in this fashion, making this spray combination more effective at killing these potentially lethal bacteria than chlorine bleach or any commercially available kitchen cleaner. The best results came from using one mist right after the other - it is 10 times more effective than using either spray by itself and more effective than mixing the vinegar and hydrogen peroxide in one sprayer.

Over 90 species of naturally occurring, insect-specific bacteria have been isolated from insects, plants, and the soil, but only a few have been studied intensively. The two studied the most have been Bacillus thuringiensis and Bacillus popilliae. Bacillus thuringiensis is found on, and may be used on many crops. Including, vegetables, cotton, tobacco, tree crops, and landscaping. The primary insects controlled by Bacillus thuringiensis are numerous moth and butterfly caterpillars, as well as, certain beetle and fly larvae. Different varieties of Bacillus thuringiensis have been formulated to control certain insects. For example, the Bacillus thuringiensis variety kurstaki controls many caterpillar pest such as horn worms, bag worms, and cabbage worms to name a few. The variety israelensis is used to control mosquito, black fly and certain gnat larvae. When purchased commercially, many of the varieties are combined to attack a broader spectrum of pests. Successful use of Bacillus thuringiensis formulations requires application

to the correct target species of pest at a susceptible stage of development, in the right concentration, at the correct temperature to ensure feeding, and before the pest enter the plant or fruit where they would be protected. As with any microbial insecticide, determining when the pest is most susceptible is the key to getting the best results. Insects have to be in a susceptible stage of development. Some species of pests have evolved resistance to certain varieties of Bacillus thuringiensis that used to work against them. Bacillus thuringiensis formulations may be deactivated in sunlight and may be effective for only a few days after application. Rain and watering the crops can wash away the Bacillus thuringiensis from crop foliage. Bacillus thuringiensis do not usually spread to other insects or cause disease outbreaks on their own as occurs with many other microbiological controls. Combined varieties of Bacillus thuringiensis are effective against a broad range of insects. The proper use of Bacillus thuringiensis may reduce need to use chemical pesticide POISONS. GMOs are not a proper use in the Author's opinion!

Bacillus popilliae. is a naturally occurring bacteria that has been mass-produced for the control of Japanese beetle larvae in turf since the 1940s. The Japanese beetle, Popillia japonica, is the specific insect that Bacillus popilliae controls. Other varieties of Bacillus popilliae have been found to work on other beetles in the family

Scarabeaidae, which include the Japanese beetle, the chafers (a pasture pest) and the beneficial dung beetles.. Bacillus popilliae was the first insect pathogen to be registered in the U.S. as a microbial control agent. A commercial product, such as "milky spore", is applied to the turf using a tube applicator. After application, the larval grubs ingest the spores of Bacillus popilliae when they ingest the roots of the grass. The bacteria begins to multiply inside the gut of the grub killing it in about 14 days. Once the grubs begin to decompose, billions of new bacteria are released into the soil. The treatment begins working upon application wherever grubs are feeding. Warm climates can achieve complete control in 2-3 years. Colder climates may require 3-5 years. Once the treatment is applied and established in your lawn it can be effective for 15 to 20 years. The cause of death is most likely physiological starvation caused by the growth of bacterial cells in the hemolymph. The treatment is most effective when applied on a region or state wide basis to reduce the overall levels of beetle infestation. It is less effective when used by small landowners, who may control larvae in their own turf only to have their plants eaten by beetles from neighboring properties. There is a high cost of production and an extremely slow rate of action, usually taking 2-5 years!

Walk-the-Plank® is one of the simplest ways to catch a rodent or animal. Using a 5-gallon to 55-gallon container

Filled ¾ to the top with water, with a plank to the rim, with either a baited can with peanut butter suspended over the middle, or floating fruit or grain, e.g., whole oats or sunflower seeds, on the water below. The water is not a concern or even visible until the pest jumps in for the food.

WARNING: There is nothing that is absolutely safe for everyone. People the Author knows will react to organic peanuts and milk. Therefore, it is up to you, dear reader, to protect yourself. Always use the safest solution for you and yours! Always test a small area before you treat the total or entire area! Think before you act! Read all of the directions and warnings before you spray/dust/use anything!

Be sure you are not sensitive to any control suggestion the Author makes and keep any and all pest controls out of the reach of children, pets and wildlife.

WHERE TO FIND MORE INFORMATION ABOUT PESTICIDE HAZARDS

The following are different sources of information about how pesticides may affect human health and the environment. Internet addresses and contact information are provided for all sources, however we can also provide you with free copies of most of this information. Call toll-free: 1-877-NO SPRAY or email info@PESTed.org to request copies.

1. Recognition and Management of Pesticide Poisoning (book) by Reigart & Roberts, 5th edition (1999), U.S. EPA. This is an excellent handbook for health care providers. Note that information about pesticides is grouped by chemical class, not by the pesticide name or active ingredient. Available free, in Spanish or English, from the US EPA by calling (703) 305-7666, or online at: www.epa.gov/pesticides/safety/healthcare/handbook/hand

2. Pesticide Fact Sheets (articles) from NCAP, published in the Journal of Pesticide Reform (magazine). Available by calling (541) 344-5044 or online at: www.pesticide.org/factsheets.html. These are in-depth articles about pesticide active ingredients, and they cover environmental as well as health effects. Free on the web; $4 to $6 each if sent by mail.

3. Chemical Watch Fact Sheets (articles) from Beyond Pesticides. Available free by calling (202) 543-5450 or online at:

www.beyondpesticides.org/pesticides/factsheets/index.htm These are two- to three-page articles about pesticide active ingredients that cover both environmental and human health effects.

4. PAN Pesticides Database (website) from Pesticide Action Network. This is a searchable database that provides current toxicity and regulatory information for almost all pesticides. Search by product name or chemical name. Available only on the web: www.pesticideinfo.org. The PAN database also includes a Pesticide Poisoning Diagnostic Tool designed to help healthcare providers recognize, manage and report pesticide related illnesses. It can help identify a pesticide or class of pesticides that may be responsible for a pesticide-related illness. This resource also provides information for reporting a known or suspected pesticide poisoning: www.pesticideinfo.org/Search_Poisoning.jsp.

5. NPIC Fact Sheets (website) from the National Pesticide Information Center (sponsored by Oregon State University and EPA). NPIC's Fact Sheets provide basic information for consumers about various pesticide products, which are listed by active ingredient on the website: npic.orst.edu/npicfact.htm. The fact sheets are written in simple language and are easy for most people to understand. NPIC also maintains a toll-free telephone service for pesticide information (1-800-858-7378), and

lists emergency treatment information for humans and animals.

6. ToxFAQ's (website) from the US Centers for Disease Control's Agency for Toxic Substances and Disease Registry. These are short summaries of basic health information about many contaminants that are commonly found at hazardous waste sites, including some pesticides. These are written in simple language and are easy for most people to understand; many are also in Spanish. Only available on the website: www.atsdr.cdc.gov/toxfaq.html.

7. Right to Know Hazardous Substance Fact Sheets (website) from the New Jersey Department of Health. These are summaries of health information about many environmental contaminants, including some pesticides. They are designed for people who are exposed to these chemicals at work, and they are written in simple language and are easy for most people to understand. Available in English and in Spanish on the website: www.state.nj.us/health/eoh/rtkweb/rtkhsfs.htm.

For free copies of many of these resources, contact Toxic Free NC toll-free at 1-877-NO SPRAY or by email: info@toxicfreenc.org.

Benjamin Franklin pointed out that, "The U.S. Constitution doesn't guarantee happiness, only the pursuit of it. You have to catch up to it yourself."

Every morning you are given another 86,400 seconds to spend wisely. Every night Life rules off as "lost" whatever time you failed to use profitably or for good purposes. You can't hoard time, save time, store time, loan time, borrow time or invest time. You can only use it wisely today—or lose it forever.

COURAGE

CREATE a better world for yourself

OPEN your mouth and speak only truth

UNDERSTAND your situation and the solution

REPEL fear

ACKNOWLEDGE your own inner strength

GET into action

EMBRACE faith as your shield and source

Deuteronomy 30:19 (NIV): *"This day I call the heavens and the earth as witnesses against you that I have set before you life and death, blessings and curses. Now choose life, so that you and your children may live!"*

ABOUT THE AUTHOR

STEPHEN L. TVEDTEN was President of Stroz Services, Inc. (an alternative pest control company) for 25 years and is currently President of Get Set, Inc., an integrated pest management company and is also currently President of PEST (Prevent Environmental Suicide Today) an environmental group, and Steve is the founder of the Institute of Pest Management, Inc., Prescriptive Nutrients, Inc. and TIPM and the Natural Pest Control Association.

Steve is the consultant and advisor for Safe Solutions, Inc. Steve is Head of the Advisory Board for the Natural Pest Control Council of America. Steve was licensed as a Michigan Residential Builder and Maintenance Alteration Contractor and holds or has held Michigan pest control certifications in the following categories: Forest Pest Management, Wood Preservation, Turf, Ornamentals, Seed Treatment, Aquatic, Swimming Pools, Cooling Towers, Right—of—way, Structural Pest Management, Wood Destroying Organisms, Vertebrate, Interiorscape, Mosquito and Public Health. Steve also holds or has held Texas pest control certifications in General, Pest Control and Termite control, New York certifications in termite, structural, pest and rodent control. Ohio pest control certification in the following categories: seed treatment, general aquatic, swimming

pool, general forest pest, timber stand improvement, wood preservation, industrial vegetation control, ornamental plant and shade tree, interior plantscape, vertebrate animal control, turf pest control, domestic, institutional, structural and health related pest control, general pest, termite, mosquito, house fly and vector control and Wisconsin certifications in forest, ornamental and turf, seed treatment, aquatic, right—of—way, general industrial, institutional, structural and health related, termite and wood preservation; State of Illinois certifications in seed treatment, right—of—way, ornamental and turf, forest, aquatic and mosquito pest control; State of Indiana certifications for seed treatment, wood preservative non—pressured, forest, ornamental, aquatic, right—of—way, residential, institutional and non—food industry pest control.

Learn more at www.stephentvedten.com

ABOUT SAFE SOLUTIONS INC.

Safe Solutions, Inc. is a world leader in the innovation of nontoxic pest control alternatives. Safe Solutions manufactures nontoxic household products for maintaining a chemical-free home or business by protecting Indoor Air Quality (IAQ) and respecting the environment.

Our green housekeeping products are safe, nontoxic, organic, sustainable, biodegradable, do not contain volatile organic compounds (VOC) or any synthetic chemicals, and replace dangerous pesticides and hazardous cleaners to eliminate risk from chemical exposure.

VOC-free, no VOC, Green Seal, Natural, Home Care, Nontoxic Cleaner, Cleaning

Our customers range from do-it-yourself (DIY) home pest control amateurs to professional pest control operators (PCO). We cater to people with multiple chemical sensitivity (MCS) disorder, environmentalists, organic farmers, and those interested in a cleaner environment. Our products have been implemented in LEED certified green buildings to promote Indoor Environmental Quality (IEQ) and occupant safety, health, comfort and well-being.

Eco-Friendly, Environmentally Friendly, Responsible,

It is estimated that between 25,000 to 100,000 species of plants, animals and insects every year are lost forever due to man's ecological footprint. There are estimated to be over 60 million species of insects in the world, only a million of which have been identified, and less than 1,000 of those are even considered to be "pests" to people.

Agriculture has waged a costly struggle fighting insects by constantly rotating obsolescent pesticides in a desperate strategy of chemical warfare. It is time to discover an alternative.

• Welcome to the cleaner future of pest control •

• Specializing in Sustainable Alternatives

Learn more at www.safesolutionsinc.com

OTHER BOOKS BY STEPHEN TVEDTEN

Natural Roach Pest Control: How To Get Rid Of Roaches Without Toxic Chemicals or Insecticides

How To Get Rid Of Lice and Nits Without Combing or Toxic Chemicals

Natural Bed Bug Treatment: How To Get Rid Of Bed Bugs Without Toxic Chemicals or Insecticides

Organic Spider Killer: How To Get Rid of Spiders Fast Without Any Pesticides, Chemicals or Toxic Poisons

How To Get Rid of Fleas: Kill Fleas Fast Without Any Pesticides, Chemicals or Poisons

Organic Ant Killer: How To Get Rid of Ants Without Pesticides, Toxic Chemicals or Insecticides

Natural Mosquito Control: How To Get Rid Of Mosquitos Fast Without Toxic Chemicals or Insecticides

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Thanks again for your support!

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